# American Druggist

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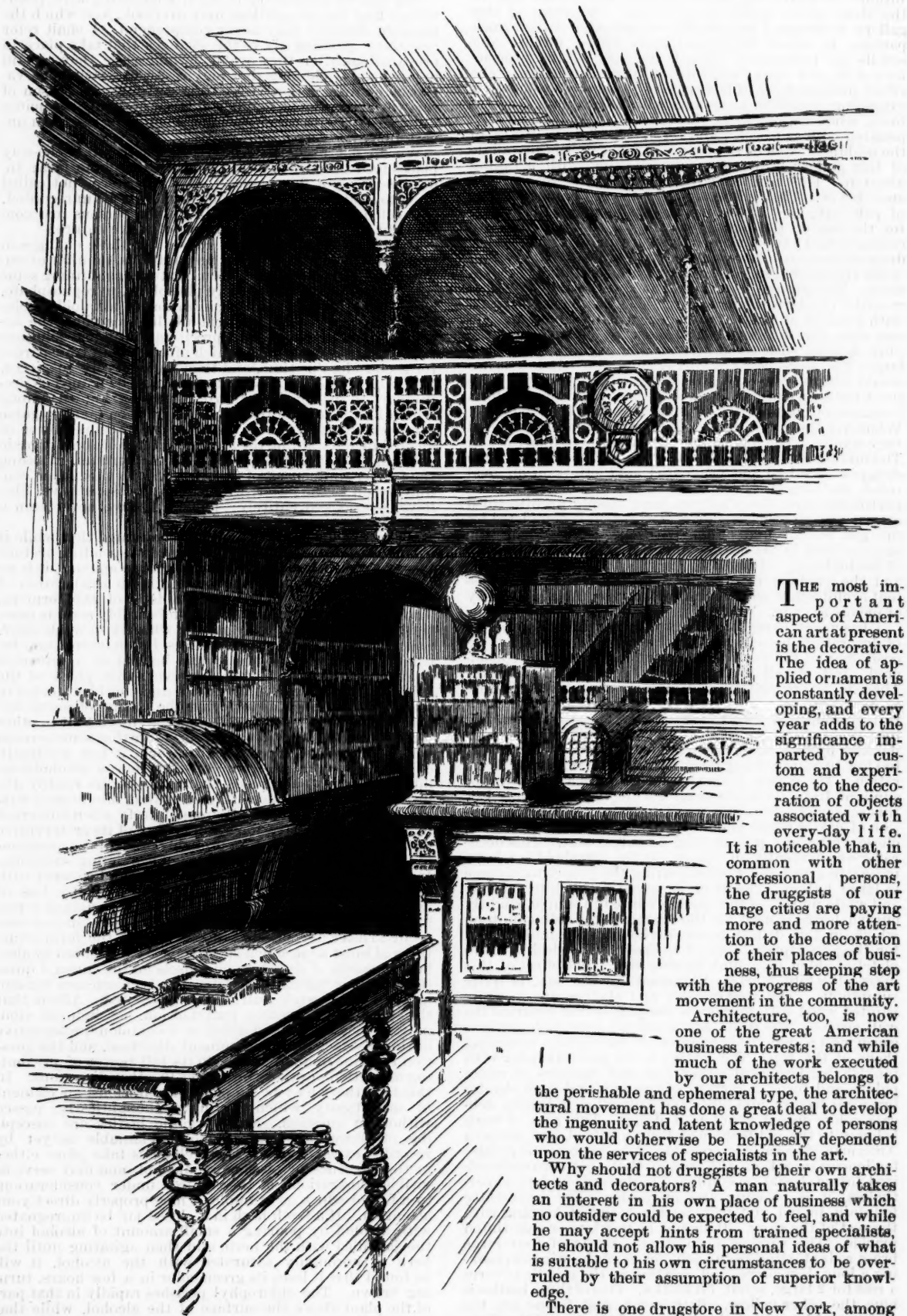
## DRUG STORE ARCHITECTURE AND DECORATION.



THE most important aspect of American art at present is the decorative. The idea of applied ornament is constantly developing, and every year adds to the significance imparted by custom and experience to the decoration of objects associated with every-day life. It is noticeable that, in common with other professional persons, the druggists of our large cities are paying more and more attention to the decoration of their places of business, thus keeping step with the progress of the art movement in the community.

Architecture, too, is now one of the great American business interests; and while much of the work executed by our architects belongs to the perishable and ephemeral type, the architectural movement has done a great deal to develop the ingenuity and latent knowledge of persons who would otherwise be helplessly dependent upon the services of specialists in the art.

Why should not druggists be their own architects and decorators? A man naturally takes an interest in his own place of business which no outsider could be expected to feel, and while he may accept hints from trained specialists, he should not allow his personal ideas of what is suitable to his own circumstances to be overruled by their assumption of superior knowledge.

There is one drugstore in New York, among several which have been established under the influence of the new decorative tendencies, in which the proprietor has successfully acted as his own architect and decorator, knowing exactly what he wanted and carrying out his ideas to suit himself. He has taken an ordinary three-story high-stoop corner dwelling, has reserved the upper part for his residence, and remodelled the lower stories into a conveniently arranged and compact store. By raising the floor he has gained fourteen feet of space in the basement, which he now uses as a laboratory and store-room. Behind the store is a small room devoted to prac-

tical matters, a staircase which leads to the clerk's room, a narrow hallway connecting with the dwelling space of the building, and an air-shaft which pierces the house to the roof and ventilates the store. The scheme of the store itself has been skilfully planned and tastefully executed. The woodwork, which is the most prominent feature of the decorations, is in light red-brown mahogany, designed, carved, and polished on the premises. The prescription counter is hidden by a screen of heavy cut glass in panels, and a gate designed with oblique forms, in imitation of a rustic one, leads on either side to the rear of the store, above which is a gallery. The front of this gallery is designed in a simple but effective lattice-work pattern, in which the round arch forms, circles, and scrolls are prominent. This is the work of the proprietor's wife, and shows a natural aptitude for design. The effect presented by this sweep of red-brown woodwork extending from floor to ceiling, with its neat and graceful lines, when viewed from the front of the store, is very pleasing both as to color and form. A colored jar rises in the middle of each of the two open arches. In the middle of this gallery is a rectangular opening with a railing about it. This is intended to ventilate the rear of the store below. The ceiling is not of the red mahogany but of pale oak, very handsome in its simplicity, the reason for the use of the lighter wood being that a mahogany ceiling would have darkened the store unduly. The many drawers and cases have simple, solid brass handles. The walls are treated in mastic color with scroll-like corrugations. The ground is divided at intervals by vertical wreaths of cherries and leaves. The frieze is light green with festoons of grapes and pomegranates above it. On one side the wall space is broken by clusters of large pink flowers with their leaves. The windows are very large; the store being a corner one, the window space would naturally be extensive, but, as it happens, the store front has been planned to give an unusually wide and high frontage of glass with as little woodwork as possible. Whatever there is is of the red-brown mahogany, treated very simply. The top is divided into three compartments. The middle one has for its sole ornament the name of the druggist in raised and graduated gold letters on an oval relief, the largest letters being in the middle. The compartments over the windows have simple architectural ornaments, and the scheme of decoration is completed by the gilt mortar and pestle, with the eagle bearing the same symbol in his beak, which projects from the corner of the building. Altogether, this façade is very effective, and the whole store presents a good example of consistent architecture and decoration based on the adaptability of means to ends.

A basement drugstore offers rather a difficult problem of decoration, because it is inclined to be dark from its position, and the idea of sufficient light must be considered first of all in planning a commercial interior. There is a very prettily and cleverly arranged drugstore at New York which offers a capital solution of the decorative problem applied to basements. The store is reached by a flight of steps, and the door, which is rather wide, is flanked by two wide, low windows. The ceiling is low, too low to admit of any dark or elaborate scheme of decoration. The corner is one which receives a great deal of sunlight from its position on a wide, open avenue. For this reason the decorator was forced to select a combination of colors which should be light yet not glaring. He chose whites and pale tints of a neutral sort. This decorator was evidently an Italian. At the threshold is a large mosaic in grays and whites, bearing the proprietor's name in large letters. The floor is paved with white marble, and white marble of fine quality carved in simple, slightly curved forms is used for the casing of the side counters, which, in this drugstore, are divided in the middle, and for the prescription desk at the rear. The desk is completely hidden by a high marble slab. The effect of this mass of white marble, illumined by the sun, is quite sumptuous. The wall casings and shelves are in white painted wood with mirrors in the panels that separate the wall spaces. The walls are painted a very pale yellow-green with a stencilled ornament of darker hues accenting them at the top. The ceiling is in pale lavender with pinkish borderings at either end, and bunches of roses, palms, and ferns, a garland of roses around each slender brass gas fixture, and birds and butterflies in bright, delicate colors dotted about as if flying. This sort of work belongs to the old-fashioned Italian school, and modern American decorators repudiate it as representing false tendencies in art, on the ground that only conventionalized forms should be employed in decoration, but, nevertheless, it is pleasing and attractive. The soda-water fountain, in red and gray marble, is out of keeping with the rest of the store. It should be in white or pale tinted marble. The window decoration consists of four large brass rods starting from each corner of the window, making a long, low curve, and meeting in the middle to form a rest for 2 large, squat, fat bottles. One of these bottles is blue, the other yellow. Both colors and forms are too strong and heavy for the delicacy of the rest of the decorations. The windows being low and broad, it is permissible to have low bottles hung low, but both these and the supporting rods should be of a lighter and more graceful character. The chairs, with their dark velvet seats and walnut frames, are too heavy. Light wooden chairs painted in white, with pale flowered designs in the upholstering, are the proper accompaniments of this scheme of decoration.

(To be continued.)

## Uncertain Medicines.*

BY J. U. LLOYD, CINCINNATI, O.

THE careful apothecary is often confronted with possibilities that the thoughtless may overlook, and which the ignorant druggist may never comprehend. I shall refer now more particularly to the changes that take place in preparations after they are made and while they remain in our hands—changes that may result in a continued variation of drug action from time to time. By reason of this variation, the physiological force of many medicines must surely, with all physicians, be more or less of an uncertainty.

We do not necessarily have to seek in out-of-the-way places for examples illustrative of the foregoing idea: indeed, scarcely a day passes that the writer is not called upon to study the matter in one or more of its unrecorded, connected phases, and probably other persons are continually confronted with problems of a like nature.

There are various known causes for these changes in properties of pharmaceutical preparations, familiar examples being the action of light on mixtures containing some compounds of iron, especially phosphate, pyrophosphate, and citrate; the slow disorganization of alkaloidal solutions (elixirs, perhaps) of slight alkaline reaction; the decomposition and subsequent precipitation of acid solutions containing bismuth salts, which often remain transparent for a considerable time, and then suddenly fly to pieces, etc., etc. These familiar examples may be named as preliminary to the consideration of others less known, among which I will mention the action of light on many organic solutions exposed thereto, and the questionable power of alcohol in maintaining the medicinal force of some organic substances that are soluble in that menstruum. Passing the former (influences of light), I will in this paper confine myself to the latter, which many persons have, I believe, overlooked entirely; indeed, I have never seen a reference thereto.

By way of a comparison, it may be stated that while it is true that alcohol has the power of suspending acetous fermentation when the alcohol is in large amount, it is no less true that in smaller amount it is an acceleration of such fermentation, being then a food of the ferment. Thus vinegar of a quality that is unbearably sour is practically made by gradually adding whiskey to weak cider, in which case the alcohol reverses its character and becomes a producer of acetic acid instead of a protector against acetification. Pass, however, that phase of the subject, which is well understood, and consider alcohol in quantities so great as to forbid the chance of acetic fermentation, and I am by no means convinced that in other directions it is the uniform preservative that some persons believe it to be. Upon the contrary, it has gradually dawned on my mind, from consideration of alcoholic solutions of many substances, that many bodies readily disintegrate in its presence. True it is that albuminous substances are coagulated and cannot putrefy when immersed in alcohol, this illustration being typical of its preservative power and an example that probably prevents us questioning its power in other directions, by quieting suspicion. If the brain of a man be placed in a jar and covered with alcohol, it becomes hard, brittle, contracts by loss of water, and is indefinitely preserved in its shrunken form; but even here I question if structural changes do not also occur to alter normal conditions. While the form structures of most anatomical specimens are preserved by alcohol by reason of its action on muscle and albumen, I question if their normal interstructural characters remain intact, even though putridity is prevented. Admit that the spirit has prevented putrefaction, has induced albuminous coagulation and acted as a common preservative in this instance in this prominent direction, and the question remains unanswered as to its full power of preventing alteration of other substances in other directions. In this field there may be, in plant preparations, an element of uncertainty which we have thoughtlessly passed without a question. Many organic bodies are susceptible of alterations that are not explainable as yet by recorded experiments. These changes take place either in the presence or absence of alcohol, and may serve as visible illustrations of the subject under consideration, to a few of which as examples I may properly direct your attention. If a fresh herb in a closed jar be impregnated with alcohol by pouring a small amount of alcohol into the jar filled with the herb, and then agitating until the herb is thoroughly saturated with the alcohol, it will be found that it loses its green color in a few hours, turning brown. The chlorophyl perishes rapidly in that part of the plant above the surface of the alcohol, while that beneath its surface sometimes remains green a considerable time, imparting its chlorophyl to the alcohol. Instead

* Read at the meeting of the Ohio Pharmaceutical Association, Mansfield, 1889, and kindly contributed by author.

of preserving the chlorophyl in the part of the plant above the liquid, the alcohol with which the plant is saturated hastens its decomposition, and a parallel experiment with a like jar of herb without alcohol shows that it will retain its green color long after the specimen saturated with alcohol has become brown or yellowish-brown.

This experiment is easily performed, and will illustrate the fact that, under certain conditions, plant constituents dissociate with increased rapidity in the presence of alcohol, which becomes then an accelerator of decomposition, and what is shown by the seen, may perhaps indicate what occurs at the same time, in other constituents of that plant structure, with the unseen. It is more than likely that simultaneous dissociations at the same time take place in other plant constituents; indeed, from my present view, there is no question on this point. Make a tincture of a fresh herb by covering it with alcohol, macerating it a short period, and quickly filtering. The tincture will at first be of a rich green. Place it aside; examination from time to time will show a gradual change to brown, and at last the green color often disappears entirely, a red-brown liquid usually being the result. (See note 1.)

It may be argued by some persons that in this instance the destruction of chlorophyl is immaterial, since chlorophyl is of no medicinal value. Accepting this view, we may, however, use the striking exhibition of alteration in color thus showing destruction of chlorophyl to permit us to question as to whether at the same time *unseen* dissociations may not be taking place in other directions, and we thus may be induced to make comparisons of the results of continued investigations which, formulated into a whole, become of service.

Pass from fresh plants to those that are dry—for many persons will refuse to accept as medicines other than those made from dry drugs. The precipitates that occur in tinctures and fluid extracts in the presence of an abundance of alcohol illustrate the fact that changes of some description are continually taking place in them. (Note 2.)

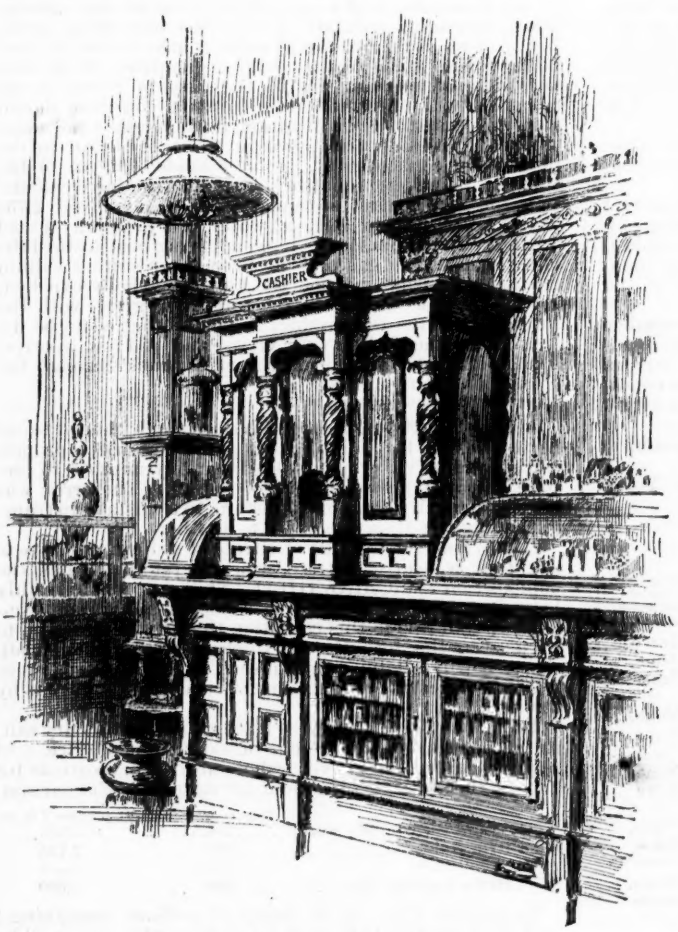
The sudden decomposition of fluid extract of Geranium maculatum, the complete disintegration of fluid extracts of Stillingia, Iris versicolor, Epigæa repens, and many others, whereby nearly all of the soluble solid constituents precipitate, indicate that alcohol fails to preserve these liquids from alteration. That these changes are of a chemical nature is indicated by the fact that a stringency of the liquid then disappears, while the resultant magma is free from astringency with geranium, stillingia, iris, and others, and no part of the entire material after decomposition is possessed of former characteristic properties. Neither the insipid serum that suspends it nor any other menstruum will redissolve this precipitate. The gelatinization of tinctures of kino and catechu

End of dispensing counter. (See page 121.)

is familiar to all persons, and, as we consider the subject in its familiar phases, the lesson seems to be: interstructural alterations that ordinary amounts of alcohol fail to interrupt are often in constant process, and these alterations may even continue to the utter destruction of the natural association of the educts originally held by the alcoholic liquid.

We have so far considered only the alterations that *visibly* affect a plant solution, and these have been cited as examples because they unmistakably illustrate what may take place in other directions in which the appearance of the liquid is not altered. Reasoning from the facts deduced from a study of the visible known, it is probable that unseen changes fully as important may be occurring in other directions. Indeed, there is every reason to infer that rearrangements of integral constituents may be continually at work in many alcoholic liquids, the result often being the production of new *soluble* bodies. Owing to the fact that there are no chemical tests for the majority of fluid extracts, these conditions can now only be determined by sensible methods. A fluid extract might become dismembered, so far as its original organization is concerned, and this fact remain hidden from observation if the resultant products are of the same color and soluble in the same menstruum. Indeed, I am sure that many substances do thus disappear in the presence of even strong alcohol. Of course the highly developed alkaloids are not liable to undergo much alteration, if any, but many very potent medicinal agents surely disappear entirely. Indian turnip covered with alcohol becomes insipid (Note 3); alcohol will not preserve its acrid principle. Tincture of Rhus toxicodendron, intensely poisonous when first made (Note 4), gradually loses its virulence and at last is practically worthless. Tincture of Anemone pulsatilla loses its anemonin rapidly and should never be carried over a season. Even a pure solution of anemonin in officinal alcohol disintegrates rapidly; it cannot be preserved. Other examples might be cited to show that active principles of plants are not altogether protected from change by alcohol, and after considerable attention in this direction I have concluded that we may well study alterations in alcoholic plant preparations with more than usual profit.

To sum up: In my opinion, any cause for uncertainty in the physiological power of a pharmaceutical preparation demands the attention and investigation of apothe-




Cashier's desk. (See page 121.)

caries and pharmacists. Alterations that occur in these preparations render the practice of medicine proportionately uncertain. Only by studious attention in the direction indicated in this paper can we hope to determine the extent of such alterations, and these studies with many preparations *must* be made before we can expect to correct the matter. In order to aid the physician, whose skill in diagnosticating disease is valueless without uniformly active remedies to meet symptoms of disease expression, we must consider the foregoing subject in connection with others that also render remedies uncertain.

Finally, I must conclude that while physicians have much with which to contend from variation of medicinal power of many of the fluids that are made from different qualities of drugs and by different applications of skill in working the same, in some important cases they also have to contend with liquids that are reliable when first made, but become worthless through age, regardless of the skill and care of the operator. In most cases these liquids are dispensed in full faith of their reliability, by reason of the confidence we have in the preservative power of alcohol.

NOTE 1.—The presence of water derived from the herb must not be overlooked in this instance. However, the large amount of alcohol present does not act as a preservative.

NOTE 2.—I do not overlook the phase of the subject contributed to the American Pharmaceutical Association in a series of papers some years ago, entitled, "Precipitates in Fluid Extracts," in which it was shown that natural laws necessarily produce many precipitates that are not dependent on any chemical alteration of plant constituents.

NOTE 3.—Alcohol, as shown by Prof. Maisch, will not dissolve its acrid constituents.

NOTE 4.—I make several barrels of this tincture each year at the proper seation, from fresh herb, because the dry drug is worthless, using strong pressure and alcohol enough to make a very strong product. Each succeeding year I expect to throw into the dreg-still a large amount of this tincture, to replace with new crop.

## Ammonium Chloride.*

BY MARY H. SPENZER, CLEVELAND, OHIO.

SINCE granular ammonium chloride is not infrequently prepared from the crude sal ammoniac, impurities existing in the latter are more or less liable to be found in the finished product; but their presence there cannot class them as adulterants. Sulphate of ammonium and chloride of sodium seem to be the more common sophistications, while empyreumatic substances, aniline, sulphate of calcium, cyanide of ammonium, sulpho-cyanide of ammonium, lead, copper, iron, zinc, lime, barium, etc., are sometimes present as impurities.

Ammonium nitrite, which Storer ("Dammer's Lexikon," page 16) has noticed in old solutions of ammonium chloride, and which is due to the presence of lower forms of plant life, is detected first by acidulating the aqueous solution with sulphuric acid and testing with metaphenylene-diamine, with which nitrites produce from a yellow to a brown coloration.

Empyreumatic substances leave a dark residue after mixing the chloride with nitric acid and evaporating to dryness.

For the detection of the other impurities their several well-known tests were applied with results as shown by the schedule, and from which it will be seen that copper, zinc, iron, empyreumatic substances, sulphate of soda, and sulphate of calcium were detected in some of the samples.

Copper was present in but traces in specimens number three and four; zinc in number eleven in similar quantity; while iron, being present in the form of ferrous chloride, did not detract anything from the white condition of the sample, in contradistinction to the yellow ferric chloride.

No traces were found of chloride of sodium, cyanides, sulpho-cyanides, nitrites, lead, or barium.

The specimens were procured in Boston, New York, Cincinnati, Columbus, and Cleveland.

| | Sulphate of Sodium. | Sulphate of Calcium. | Sulphates (in general). | Iron. | Empyreumatic Substances. |
|---|---|---|---|---|---|
| 1 | Trace. | Faint trace. | Trace. | Trace. | Trace. |
| 2 | None. | None. | None. | None. | None. |
| 3 | " | " | " | " | Trace. |
| 4 | Some. | Faint trace. | Some. | " | " |
| 5 | None. | None. | None. | Trace. | None. |
| 6 | " | " | " | None. | Some. |
| 7 | Trace. | Faint trace. | Trace. | Trace. | Trace. |
| 8 | None. | " | Faint trace. | " | None. |
| 9 | Some. | " | Some. | " | None. |
| 10 | None. | None. | None. | None. | " |
| 11 | Some. | " | Some. | Some. | Some. |
| 12 | " | " | " | None. | None. |
| 13 | None. | " | None. | " | " |
| 14 | " | " | " | Trace. | Trace. |
| 15 | " | " | " | Some. | Some. |
| 16 | Trace. | " | Trace. | None. | " |

* Read at the meeting of the Ohio Pharmaceutical Association in answer to Query No. 76: What are the Impurities of Granular Ammonium Chloride of the market?

[ORIGINAL COMMUNICATION.]

## TINCTURE OF CITRO-CHLORIDE OF IRON.

BY F. B. WELLS, PH.G.

I HAD occasion to renew my supply of tincture of citro-chloride of iron (N. F.) shortly after reading your article on page 100 of the May number. I thought the suggestion to make an extemporaneous solution of citrate of sodium an excellent one. At the same time it struck me that the cost when made in that way would be nearly as great as when the dry sodium citrate is used (quite an anomalous condition in the price of such chemicals); also, I could not see how a product measuring only 16 fl. oz. could be obtained, without evaporation, by using "sodium bicarbonate, 2,280 grains; citric acid, 4,160 grains; water, 7 fl. oz.," in addition to 4 fl. oz. sol. chloride iron and 2½ fl. oz. alcohol; lastly, I thought the quantities of the citric acid and sodium bicarbonate wrong. I calculate the quantities of acid and bicarbonate to make the three citrates of sodium as follows, each calculated to make 7 troy ounces:

*Neutral Sodium Citrate* ($Na_3C_6H_5O_7$).

$$\overset{252}{3NaHCO_3} + \overset{210}{H_3C_6H_5O_7.H_2O} = \overset{258}{Na_3C_6H_5O_7} + \overset{132}{3CO_2} + \overset{72}{4H_2O}.$$

258 : 3,360 :: 210 : 2,734.88 grains citric acid.
258 : 3,360 :: 252 : 3,281.86 grains sodium bicarbonate.
258 : 3,360 :: 132 : 1,719.07 grains carbon dioxide.
258 : 3,360 :: 72 : 937.67 grains water.

*Di-Sodium Hydrogen Citrate* ($Na_2H.C_6H_5O_7$).

$$\overset{168}{2NaHCO_3} + \overset{210}{H_3C_6H_5O_7.H_2O} = \overset{236}{Na_2HC_6H_5O_7} + \overset{88}{2CO_2} + \overset{54}{3H_2O}.$$

236 : 3,360 :: 210 : 2,989.83 grains citric acid.
236 : 3,360 :: 168 : 2,391.86 grains sodium bicarbonate.
236 : 3,360 :: 88 : 1,252.88 grains carbon dioxide.
236 : 3,360 :: 54 : 768.81 grains water.

*Sodium Di-Hydrogen Citrate* ($NaH_2C_6H_5O_7$).

$$\overset{84}{NaHCO_3} + \overset{210}{H_3C_6H_5O_7.H_2O} = \overset{214}{NaH_2C_6H_5O_7} + \overset{44}{CO_2} + \overset{36}{2H_2O}.$$

214 : 3,360 :: 210 : 3,297.19 grains citric acid.
214 : 3,360 :: 84 : 1,318.87 grains sodium bicarbonate.
214 : 3,360 :: 44 : 690.84 grains carbon dioxide.
214 : 3,360 :: 36 : 565.23 grains water.

In these calculations, I make no allowances for impurities of materials, which would be slight, nor for water of crystallization, which might make a great difference in the amount of the chemicals required; but I do not find the complete formulas of the several citrates in the books at my command, and I am obliged to make my calculations, assuming that all of them are anhydrous salts. If any or all of the citrates of sodium have water of crystallization, it would require smaller quantities of the acid and alkali; applying this to the case in point, if the citrate of sodium formed in the formula you gave should have any water of crystallization, it would make the quantities still greater, and, perhaps, make the error in the proportions equally great. I have made 16 fl. oz. of the tincture, using the quantities given in the above calculation for the neutral sodium citrate. I dissolved 2,735 grains citric acid in 5 fl. oz. water, and gradually added 3,282 grains sodium bicarbonate, applying heat toward the last to expel the gas and to keep the resulting sodium citrate in solution. When the gas was wholly expelled, I proceeded according to the directions given with the formula. To me the product seems all that could be desired, but I should like your views, and, if I am in error, I should like to be put on the right track through the columns of your journal.

GREENFIELD, MASS., May 27th, 1889.

*Note by Ed. Amer. Drugg.*—We are much obliged to our correspondent for pointing out the error in the proportions given by us, on page 100 of our May number, to prepare 7 troy ounces of citrate of sodium. The error was due, so far as we can now ascertain, to a mistake in transferring figures from one paper to another.

Concerning the formula of citrate of sodium, we have to say that a *neutral* citrate, when crystallized, has the composition $2Na_3C_6H_5O_7.11H_2O$. This salt, which readily loses its water, may easily be rendered anhydrous, $Na_3C_6H_5O_7$, and it is in this condition that it was supposed to be used in the formula for tinctura ferri citro-chloridi, where it will be advisable to insert, after the words "citrate of sodium," the following: "rendered anhydrous by drying."

To produce 7 troy ounces, or 3,360 grains, of this dry salt, the proportions of bicarbonate of sodium and of citric acid required are as below given, where also the proportions for 1 molecule of citrate of sodium are stated, for comparison:

| | *To prepare 1 mol.* | *To prepare 7 tr. oz.* |
|---|---|---|
| Sodium Bicarb. (99% pure) | 254.52 | 3,315 |
| Citric Acid | 210. | 2,735 |
| Citrate Sodium (dry) | 258. | 3,360 |

To prepare 7 tr. oz. of citrate of sodium containing 1 mol. of water ($Na_3C_6H_5O_7.H_2O$; mol. w. 276) there will be required: Sodium bicarbonate (99%) 3,098.5 grains, and citric acid 2,556.5 grains. The figures given by Mr. Edel (see below, page 137), correspond practically or approximately to a citrate of sodium with 2 molecules of water.

## HOT-AIR APPARATUS FOR GENERAL PHARMACEUTICAL WORK.

CHARLES W. PHILLIPS, of Cincinnati, describes in the *Pharmaceutical Record* of May 20th, as follows, an apparatus for facilitating general pharmaceutical work:

A represents a heating stove, either a sheet-iron or a cannon stove being best adapted to the purpose. If this stove could be down-stairs and not on the same level as represented, the hot air being conducted up after the manner of a hot-air furnace, it would work still better.

B represents the stove-pipe connected with the chimney. This is made to fit neatly where it passes through the drum, so as not to allow the hot air to be wasted.

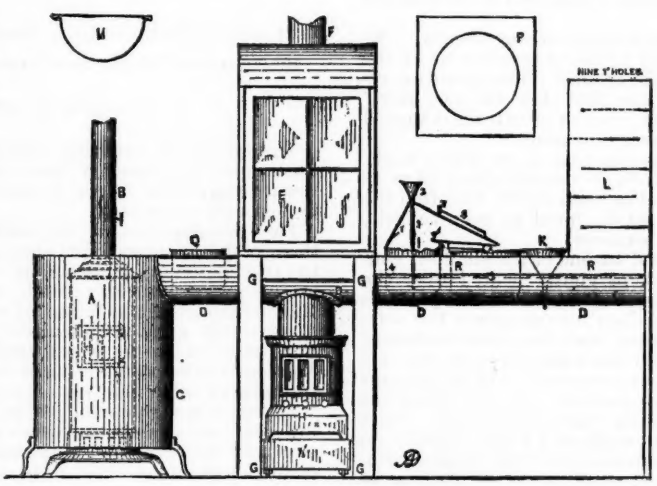
C represents the drum, which is raised several inches from the floor and open at the bottom, so the hot air will ascend and start a current through the entire apparatus. The top of the drum, being flat, can be used for heating beakers, evaporating dishes, etc., if desired.

D, a semi-circular pipe for conducting the hot air horizontally.

E, the fume chamber, which is connected with the chimney by the pipe F. The back of the fume chamber contains a large pane of glass and should be placed near a window; the front contains a sliding sash supported by a pulley, so that it can be raised or lowered at will. The front and back of the fume chamber being of glass, the progress of any operation can be watched without disturbing the heat or filling the air with foul odors.

G, the lower part of the fume chamber, which is inclosed like a closet, the front door of which has been removed in the cut. The object in having it closed is to protect the oil stove from currents of air and thus prevent it from smoking. In this way the doors and windows of the laboratory can all be opened, if desired—a very important item in hot weather.

H, the oil stove, which is one having three 4-inch wicks and is connected by a 7-inch pipe to the horizontal pipe. The oil stove is set on a small box, *h'*, fitted with rollers at the bottom, so that the oil stove can be easily rolled out for filling.



Phillips' Hot-Air Apparatus.

I and J are stills that are made to set part way down it on the horizontal pipe. The top has been removed from still J in the cut, and still I has been turned sidewise in order to show its construction. The outer part of the still I is the same construction as the still J, only smaller. The condenser cylinder slips snugly down into the outer cylinder to the bottom, as represented by Fig. 4, thus forming a water-joint. Fig. 1 represents a shallow gutter around the inside of the still-head, which serves to collect any liquid that may condense on the top of the condenser before it reaches the beak and runs it out with the rest of the distillate, thus materially hastening the distillation. Figs. 2 and 3 represent a funnel tube reaching to within a half-inch of the bottom of the still, being soldered tight at the top. Fig. 5 represents a condenser, Fig. 6 the influx tube, and Fig. 7 the overflow. The condenser is soldered perfectly tight to the beak, and the tubes 6 and 7 are made of lead pipe. The advantages of a still of this construction are:

1. It is easily taken apart and cleaned.
2. It requires no luting.
3. It can be replenished by means of the funnel tube without taking down the apparatus.
4. In making fluid extracts, owing to its round bottom, the residue is always obtained in a compact mass.

K represents a hot funnel, which is simply a glass funnel inserted in a 6-inch hole in the flat part of the hot-air pipe D and a 1-inch hole in the lower part of the pipe. When not required for filtering, the funnel can be removed and the hole covered with a piece of sheet-iron, or it can be used for a small evaporating dish or any other purpose. L represents the drying oven, showing a sectional view, the side being removed. Being at the end of the apparatus, it is always ready for use without extra expense. The oven can be made of wood, with a pane of glass at the back and a sash door in front. The top should have eight or nine 1-inch auger-holes to allow the hot air to escape. The draft can be regulated by inserting one or more corks as required; one of the holes will serve for the introduction of a thermometer through a perforated cork.

M represents a sectional view of the horizontal pipe. It is simply a 24-inch piece of sheet-iron bent into a semicircle with a flange, N, on each side. The diameter is then about 15 inches and the depth about 8 inches, which is a very convenient and inexpensive size. The flange N is supported on either side by a bar of wood, R, which sustains all the weight of the stills, etc. O shows the manner in which the sheet-iron plates are secured on top of the apparatus.

P shows a sheet-iron plate for the fume chamber. This plate is 22 inches square, with a circular hole 15 inches in diameter, and will accommodate a 3-gallon evaporator. Separate plates having circular holes 6, 7, 9, 11, and 13 inches in diameter will be found much stronger and more convenient than concentric rings, and will accommodate any evaporator from a half-pint up.

Q can be used as a sand-bath, water-bath, or water-still, but is generally too hot for fluid extracts.

This apparatus will be found available for many purposes. It has the advantage over a steam apparatus in that it does not require watching, will not freeze up in winter, and when any of the holes are not in use a flat piece of sheet-iron laid on top is a sufficient cover, no extra-tight joints being required. Another advantage is that the heat can be regulated (especially when using the oil stove) so that the apparatus will maintain a constant temperature for hours at a time, and when once the condensing water is regulated the stills can be left to themselves until the work is complete. The stills being removed and a flat piece of sheet-iron laid on the horizontal pipe, it will form a nice, warm table for spreading plasters. Either the fume chamber or the drying oven, or both, can be fitted with movable muslin trays and be used for making granular effervescent salts, or drying drugs previous to grinding or powdering. The drying oven can be fitted with movable glass shelves and used for making scale preparations. The drying oven, however, is especially valuable as a means of recovering ether. An ordinary half-gallon or gallon bottle, filled with the ether to be recovered, is placed on the lower wooden shelf of oven, the other shelves having been removed. It is then connected with a block-tin pipe by means of a closely fitting perforated cork. The pipe passes out through a hole in the side of the oven and down through an upright Liebig condenser which is supplied with a stream of cold water. Ice water is not required. When the air in the oven, as indicated by the thermometer in the top, reaches 125° to 130° F., the ether in the bottle begins to boil and distil over. Care should be taken now to have the temperature carefully regulated, and this is comparatively easy. As the door and back of the apparatus are glass and the bottle also, the operation can be easily watched and is absolutely under control. The distillation being conducted at a low temperature, there is no difficulty in condensing the vapors and practically no loss. In the meantime all the rest of the apparatus can be used for any other purpose. When the stills are not in use making fluid extracts or recovering alcohol, they can be running distilled water.

The greatest heat obtainable in the fume chamber directly over the oil stove is 420° F., and the greatest heat obtainable in the drying oven, 4 feet distant, is 220° F. With the heating stove the temperature obtainable is about the same, but cannot be quite so nicely regulated, although by the use of dampers much can be done. It is seldom necessary, however, to use the heating stove, as the oil stove in connection with this apparatus will keep a room 16x20 feet warm when the outside temperature is 32° F. While this is an advantage in winter, it is a great disadvantage in summer. I have seen the temperature of the room go up to 120° F., and that within an hour after the apparatus was started. Leaving out a few days in June, July, and August, the apparatus can be used comfortably nearly the year round.

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**How to Make Ground Glass.**—A writer on this subject says: I desired to have several pieces of ground glass to use for some purpose. I first bought five cents' worth of emery and two plates of glass of the size required. Spoiled negatives will answer if they are cleaned, which can be done with a strong solution of lye. I placed one of the glasses on a flat board, and sprinkled a small quantity of emery on it, which I wetted with water. Placing the other glass on that, I ground them together, renewing the emery and water whenever necessary. In about one hour I had two of the finest quality of ground glasses, fully as good as those I would have to pay seventy-five cents for 8 by 10 size.

## Extract of Opium—Chinese Method of Preparing.*

BY JOHN CALVERT, OF SAN FRANCISCO.

SOME years ago I had an excellent opportunity of observing the process of manufacturing this extract as followed by the Chinese experts who prepare the domestic article from Turkey opium in San Francisco. The details of the process are kept a profound secret by them and their employers, the wealthy Chinese merchants, but, owing to exceptional circumstances, I was enabled to study the subject and become thoroughly conversant with every point. And I may as well state, before proceeding further, that I am betraying no confidences, and I paid dearly for the information which I am about to place before you. I do not think that even now I should have been inclined to expose the details of a process which has a considerable commercial value, except for the reason that this occasion is a remarkable one in the history of American pharmacy.

I need not tell you how to prepare extract of opium. It is merely an aqueous infusion evaporated on a water-bath to a pillular consistence. An addition of 5 per cent of glycerin is ordered in the last edition of the United States Pharmacopœia.

The Chinaman proceeds otherwise. His apparatus consists of two charcoal-burning fire-clay furnaces, about 15 inches high and of about the same width, open on three sides; some palm leaf or other cheap fans, for fanning himself and the fire; several brass pans, such as are here shown; a brass ladle and several tin ones; a large spoon for skimming; a gridiron, two pairs of pincers for lifting the pans, and some thick woollen cloths to protect the hands, some fibre brushes, several buckets, basket strainers, muslin for straining, fibrous material for drawing off the liquor, some heavy sticks to be used as pestles, several spatulas about a foot long and 3 inches wide at the lower end and made of oak or ash, and a steel-bladed scraper.

One or two low stools complete the arrangements. The operator does not require any tables or benches, as all the work is done on or near the ground. The operation requires two days, but after the first day the two days' work goes on regularly, and a batch of extract is turned out by the same workman every evening.

The quantity of opium operated upon, so that a workman can do a fair day's work, is usually about 16 or 18 pounds. The balls are placed in tepid water, to soften the surface, and they are washed by hand to remove grit, leaves, and other foreign substances.

The material is then placed in one of the shallow, concave brass pans, which is kept gently heated over the naked charcoal fire, and by means of the wooden pestle is kneaded into a soft paste. When homogeneous, the softened opium is uniformly spread over the inner surface of the pan, and patted down by the hand, so as to give it a smooth surface. The heat is continued until the greater part of the moisture has evaporated, and the opium has become so solid that the pan can be turned over. The direct heat of a very small fire is now allowed to act directly on the face of the opium by turning the pan upside down. This has to be carefully and skilfully done. As soon as the surface of the material has become sufficiently hardened, it is deftly removed in thin layers, and this is continued until all the opium has been taken from the pan, except the dried portion which remains attached to the bottom and sides of the vessel. This is scraped off.

The gridiron now comes into play. The crusts which were laid aside in the former operation are now put on the gridiron, a few at a time, with the greatest care to avoid breaking them, and are toasted over the charcoal at a low temperature until they have become perfectly crisp. The crusts are then placed in one of the brass pans, covered with warm water, and left standing until the next morning.

On resuming work the infusion is drawn off into buckets through baskets lined with muslin strainers.

The brass pan is slightly tilted, and, by means of a knot of vegetable fibre, the liquor is drawn off over the edge of the pan without loss. The roasted opium is drained, and a second quantity of warm water added, with as little breakage of the crusts as possible, and the extraction is finished with a third lot of water. Only the first and second infusions are used for the extract; the washings and weak infusion are employed for the extraction of the next batch. There seems to be no precise rule as to the quantity of water for making the infusion; the crusts are merely covered.

The infusion is then mixed with some egg albumen, and a part of it is placed in the largest of the brass pans over the naked charcoal fire, and is heated, skimmed, and boiled constantly. The pan is not filled, but room is allowed for frothing, and fresh portions of warm infusion containing albumen are added from time to time as the bulk diminishes. During the boiling there are several matters to be attended to, such as keeping up the fire, or banking it up with ashes if too hot, prevention of boiling over by addition of small quantities of the infusion or of water, and keeping the sides of the pan free from hardened extract. This is effected by water and the fibre scrubbing brushes. When all the infusion has been added, and the evaporation has proceeded as far as is considered to be necessary, the pan is removed from the fire, and the extract constantly stirred by means of a wooden spatula in a current of air produced by fanning until cool and uniformly mixed.

The yield of extract varies according to the kind and quality of opium, but I have not observed any very remarkable difference between the results of this and those of the ordinary pharmaceutical methods. Eighteen pounds of the first quality Turkey opium generally yield about ten pounds of this extract.

The greatest watchfulness is exercised over the roasting or toasting part of the process. Although a small exposed corner of the crusts may become charred occasionally, the object of this operation is to expose the opium to such a heat only as to render it porous, to do away with the quality of stickiness, which is said by some authors to be produced by an easily decomposed caoutchouc-like substance, and to allow the aqueous extractive matter to ooze out of the material without stirring.

Notwithstanding the constant repetition of cautions in all the text-books, dispensatories, and other pharmaceutical literature respecting the care to be observed about subjecting opium to heat, I do not find that there is any appreciable difference in the yield of morphine when opium has gone through this barbarous process.

Whatever changes may take place among the other proximate constituents is not known, but I am quite satisfied as to the fact that the natural morphine salts, protected by extractive, are not decomposed, or only to a very small extent, by such a heat as is necessary for the desired alteration of the valueless or inert matters contained in opium.

* Paper read at the Annual meeting of the Am. Pharm. Assoc. at San Francisco.

## Is It not Advisable to Drop from the United States Pharmacopœia all Compound Galenical Preparations? *

BY JOSEPH P. REMINGTON.

THE efforts of scientific therapeutists and pharmacists during the last century have been constantly directed toward simplicity in the composition of the remedies intended to heal the sick.

The development of the study of therapy has shown that great difficulties have to be encountered in determining the true action on the economy of even the simplest and most decided remedies; and, whilst this remains true, the knowledge of the action of compound remedies must involve still greater difficulties, and to a great extent it must continue to be based upon empirical observations. To recur to the past, the most celebrated remedies of our forefathers were marvels of polypharmacy; the famous "Theriaca Andromachi," with its farrago of sixty-one different ingredients, furnishes a good illustration. This electuary was prepared under official supervision; in some countries the ingredients were openly placed upon tables in the streets for the inspection of physicians and examiners, and in Nuremberg, as late as the eighteenth century, the preparation of theriac was celebrated with great pomp as a national festival. With the decline of mystery, superstition, and witchcraft in the composition of medicines, at each revision of the pharmacopœias the compound galenical preparations which have been based upon them have been gradually improved, until the theriac of old has been shorn completely of its mystery and its majesty. The French Codex, however, still retains theriac with fifty-seven ingredients, although there has been some improvement even here, as at one time the "Electuarium opiatum polypharmicum" of the Codex contained seventy-two ingredients, including the flesh of the viper.

The British Pharmacopœia, under the name of Confectio Opii, retains all that was valuable in "poor old theriac," by making it from opium, black pepper, ginger, caraway, tragacanth, and syrup, while the United States and German Pharmacopœias omitted it entirely in the last revisions. A study of a number of other compound galenical preparations will show what the tendency of modern pharmacy has been in the past, and it is wise and timely to consider what should be the policy of the Committee of Revision of the Pharmacopœia in the future in regard to this class of preparations. A pharmacopœia must be conservative if it is expected to be useful in this country. It cannot be hoped that the practice and habits of over one hundred thousand physicians and pharmacists can be changed by one stroke of the pen of the committee, particularly when we reflect that there is no legal obligation whatever for one of them to use the Pharmacopœia; hence the wisdom of former revisers has been shown in *gradually* moulding and educating those for whose use the Pharmacopœia was devised, by admitting compound galenical preparations, but at each revision omitting such ingredients as were found to be superfluous, and thus therapy and phar-

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

macy have been improved and brought nearer the goals of exactness and accuracy.

Another question presents itself in this connection: Shall the Pharmacopœia *admit* any compound galenical preparations at its next revision? This brings into view another object of a pharmacopœia, which is to improve the practice of medicine and pharmacy already existing in the country; if the Pharmacopœia persistently ignores the existence of preparations that are in constant use, and refuses to admit them, it simply weakens its own influence and defeats its own object of being an authoritative guide in medicine and pharmacy upon the practice of its own time.

Then is it not wisest to admit such compound galenical preparations as have fully proved their usefulness by their extensive employment? If they are admitted, they should be purged of all superfluities, and the processes made so practical and free that every pharmacist in the land can make them without prejudice to his neighbor. In conclusion, the writer desires to answer the query by stating that it is his opinion that all compound galenical preparations which have not thoroughly established their usefulness throughout the country should be dropped from the next revision of the United States Pharmacopœia, and that none should be admitted to that authority except such as will stand the same test of extended usefulness; and if admitted, the processes must commend themselves to the practical worker as models of simplicity and elegance.

## Laboratory Notes. *

BY PROF. E. L. PATCH.

MUCH dissatisfaction has been expressed with the U. S. P. formula for solution of magnesium citrate.

If made strictly according to the formula, after a time there is a copious precipitation of crystals.

Examination of the crystals proves them to be $Mg_3(C_6H_5O_7)_2.10H_2O$.

This hints at an insufficiency of citric acid to produce the permanently soluble acid magnesium citrate.

In our text-books and chemistries we have two formulas for magnesium carbonate, $3MgCO_3.Mg(OH)_2.3H_2O$ and $4MgCO_3.Mg(OH)_2.5H_2O$.

Several samples examined for magnesium, as MgO and $Mg_2P_2O_7$, gave as a mean 24.8% of magnesium.

Several determinations of $CO_2$ gave 49%.

This would give 69.44% of $MgCO_3$, 11.98% of $Mg(OH)_2$, and 18.58% $H_2O$, corresponding to the formula $4MgCO_3.Mg(OH)_2.5H_2O$.

The reaction with citric acid would be as follows:

$$4MgCO_3.Mg(OH)_2.5H_2O(484) + 5H_3C_6H_5O_7.H_2O(1,050) = 5MgHC_6H_5O_7 + 16H_2O + 4CO_2.$$

Then the U. S. P. formula must have its magnesium carbonate reduced in quantity or its citric acid increased, as seen by the following equation:

484 magnesium carbonate is to 78 Gm. magnesium carbonate as 1,050 of citric acid is to 170 Gm. of citric acid.

The syrup of citric acid cannot supply the deficiency, as 480 Gm. of syrup contain 480 × .008 or 3.84 Gm. of citric acid, which is not quite enough to react with the potassium bicarbonate, as seen by the following reaction:

$$3KHCO_3(300) + H_3C_6H_5O_7.H_2O(210) = K_3C_6H_5O_7 + 4H_2O + 3CO_2.$$

Then 300 Gm. of bicarbonate is to 16 Gm. of bicarbonate as 210 Gm. of citric acid is to 11.2 Gm. of citric acid, and 11.2 Gm., less 3.84 Gm. in the syrup, would leave 7.36 Gm. deficiency.

This added to the 14 Gm., deficient on account of the magnesium carbonate, would leave 21.36 Gm. deficiency if the final reaction was to give acid citrate of magnesium.

This is not required to give a permanent solution, but we may allow the excess of bicarbonate to be decomposed by a portion of the acid citrate first formed.

For a permanent solution, dissolve 170 Gm. of citric acid in 800 Gm. of the hot *distilled* water, add the 78 Gm. of magnesium carbonate through a sieve, stir until dissolved, add cold distilled water to make 1,000 Gm., add the 480 Gm. of syrup of citric acid, filter through a plaited filter, and wash with water to make the filtrate weigh 1,500 Gm.

Place 250 Gm. of this solution in each of six magnesium citrate bottles, previously fitted with wires and corks. Gently add, so as to float on top of the previous solution, without mixing, 80 Gm. of distilled water, and, lastly, gently add 30 Gm. of a solution of bicarbonate of potassium, made by dissolving 16 Gm. of the bicarbonate in 150 Gm. of distilled water, filtering through a small filter, and washing the filter with distilled water to make in all 180 Gm. of solution.

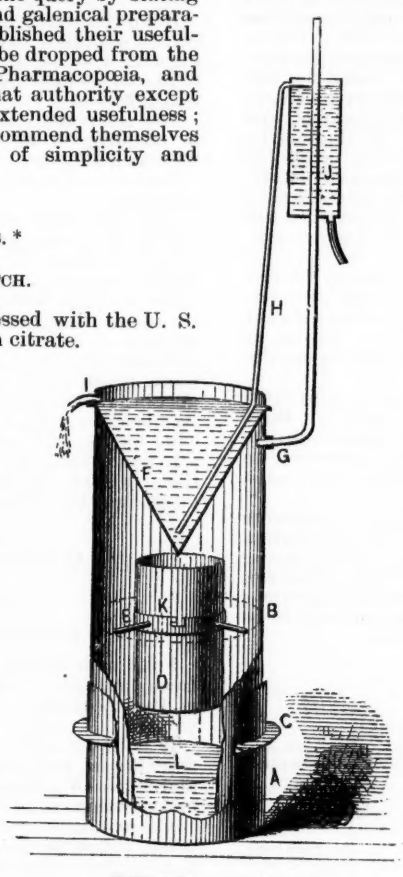
After adding the 30 Gm. of potassium bicarbonate solution, if need be, gently add distilled water to nearly fill the bottle, cork with smooth, firm, wetted corks, wire, shake, label, and store the bottles, lying upon their sides, in a cool place. Fifty lots so made have never crystallized, and invariably gave bright, permanent solutions.

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

## CONTINUOUS EXTRACTION APPARATUS.

CHARLES W. PHILLIPS, of Cincinnati, suggests a form of extraction apparatus, continuous in operation, for use with a hot solvent, and of capacity for treating one pound of drug.

A represents the outer cylinder and is 8½ inches in diameter and 7 inches high, with a circular flange 1 inch wide 4½ inches from the bottom, which serves as a support when the apparatus is set into the hot-air pipe.




Phillips' Extraction Apparatus.

B represents the inner cylinder, which is 20 inches high and goes to bottom of cylinder A, fitting snugly.

D represents the percolator, which is simply a cylinder 4½ inches in diameter and 7 inches long, open at both ends, but wired on the inside at the bottom, in order to support the perforated plate, which can be covered with flannel or muslin and fit inside and be taken out for cleaning. Another perforated plate of the same size lies on top of the drug, but need not be covered.

E represents the wires soldered to the inner cylinder, and serve to support the percolator, which has two small projections that are locked into the ring.

F represents a funnel-shaped condenser which is 7 inches deep.

G represents an opening in the cylinder B which serves to allow the air to escape when setting up the apparatus, and also for the introduction of a pipe by means of a perforated cork, and connected with the condenser J, which serves to condense any vapors that have escaped the condenser F, and return the liquid to the apparatus. The condensing water from J can be run by the pipe H into the condenser F, thence through the pipe I to the drain. The vapor from the liquid L will rise, condense on the condenser F, adhere to the sides of the condenser, run down and drop into the percolator D, which being entirely surrounded by the hot vapor, the extraction is accomplished almost at a boiling heat.—*Pharm. Record.*

## A Substitute for Musk.

MESSRS. SCHAUFFER & HUPFELD have patented a process for the manufacture, by chemical means, of a substitute for musk. They take 3 kilos. of metaxylol with 2 kilos. of isobutyl alcohol, add 9 kilos. of chloride of zinc, and heat the whole at a temperature of 220° to 240°, until the pressure, which at first rises at the rate of 25 or even 29 atmospheres, has descended to below 6 atmospheres. The process takes from six to eight days. The resulting hydrocarbon, corresponding to the formula $C_{13}H_{18}$, is collected, and the part of it which boils between 190° and 230° is rectified. The product of this reaction yields with water a red-brown oil, which is washed with water, rendered slightly alkaline, and is then ready for use.—*Chem. and Drugg.*

Regarding this article, Messrs. Schimmel & Co. say in their last report (April, 1889) that they have carefully examined the product, and find it absolutely useless and valueless for perfumers. It is a liquid having an odor of succinic and nitric acids, and leaves a musk-like odor only after having been largely diluted and volatilized. But the perfumer requires the musk odor, as such, ready-made, and not latent, in which shape its adjustment would be beyond his control.

**Chromic Acid as a Remedy for Sweating Feet.**—The problem which seems to be causing German military men the greatest trouble is the relief of excessive perspiration of the feet. The medical department of the army has just recommended painting the skin of soldiers' feet with a 5 or 10% solution of chromic acid once in 2 or 3 weeks; indeed, in some cases, an interval of 6 or 8 weeks suffices. It is said that the remedy was tried on 18,000 soldiers before its use was thus recommended.

## Nux Vomica.*

BY W. SIMONSON, OF CINCINNATI, O.

WHEN at the next revision of the Pharmacopœia the total alkaloids become the basis of adjustment of strength of tincture of nux vomica, change from the present standard of 2 per cent dry extract will require that the average alkaloid value of that extract be accurately determined.

From an abundant number of assays of the pillular extract, as reported by a number of analysts, the average is usually taken to be 15 per cent, and in some assays of commercial powdered extract, as detailed in the Proceedings for 1888, the average of such specimens as appeared to have been well made was near, but above, that figure. An unusual experience in preparing the tincture as directed by the Pharmacopœia, the value in alkaloids being also found, and in making a number of lots of the powdered extract, using in all cases the commercial powder, but carrying the extraction as near to exhaustion as practicable, has shown that the value in total alkaloids of the dry extract was between 16.5 per cent and 17.25 per cent.

The object of this note is to direct attention to the fact, doubtless long well known to many, that, using the officinal menstruum—alcohol of 80 per cent—the extractive in the first part of the percolate is poorest in alkaloids, and that the percentage value of the extract in alkaloid increases as the exhaustion proceeds. Hence, while the quality of the drug must vary, from causes of nature, part of the observed variations are probably due to art, inasmuch as, using the same materials, the total extract will be weaker or stronger as the exhaustion is less or more complete.

In support of this statement two percolations of nux vomica were made, and the fractions of each percolate examined as detailed in the two following tables. In the first the drug was used in coarse powder, known as "rasped," and in the second in the fine powder as usually seen in commerce.

1. Fifty pounds of rasped nux vomica were percolated with alcohol (80 per cent) to obtain 150 pounds, in three equal fractions. The percolation was rapid, and necessarily extraction was far from complete, it being preferable to waste drug rather than alcohol—conditions that must apply on a large scale.

2. Two kilogrammes of finely powdered nux vomica were treated according to officinal instruction, the percolation being at the rate of about 500 grains daily, and stopping when 10 kilogrammes of percolate had been obtained, taken in ten fractions. In time and under other conditions of percolation these two extractions are believed to be extremes as conducted in ordinary practice.

### I. DRUG AND MARC.

| | | Alkaloids. | Strychnine in Alkaloid. | Degree of Extraction. |
|---|---|---|---|---|
| Drug | Assay 1..... | 2.518 per cent. | 55.7 per cent. | |
| | " 2..... | 2.54 " | 55.2 " | |
| Marc | Top of column... | 1.19 " | 54.3 " | 53.2 per cent. |
| | Bottom of column | 1.659 " | 54.3 " | 34.7 " |
| Total extraction as shown by residue in Marc.... | | ..... | ..... | 44.0 " |

PERCOLATE.

| Fraction. | Extract. | Alkaloid in Extract. | Fat in Extract. | Strychnine in Alkaloid. |
|---|---|---|---|---|
| 1 | 5.788 per cent. | 15.00 per cent. | 43.7 per cent. | 53.5 per cent. |
| 2 | 2.09 " | 18.60 " | 25.0 " | 53.3 " |
| 3 | 1.52 " | 19.25 " | 18.1 " | 55.0 " |

### II. DRUG AND MARC.

| | | Alkaloids. | Degree of Extraction. | Total. |
|---|---|---|---|---|
| Drug | Assay 1..... | 2.886 per cent. | | |
| | " 2..... | 2.886 " | | |
| | " 3..... | 2.892 " | | |
| Marc | Top of column.. | .42 " | 85.5 per cent. | |
| | Middle of column | .73 " | 74.67 " | |
| | Bottom of column | .842 " | 70.90 " | 77.0 per cent. |

**Strychnine in alkaloids from drug and marc 51.5 to 53.0 per cent.**

PERCOLATE.

| Fraction. | Extract. | Alkaloid in Extract. | Fat in Extract. | Strychnine in Alkaloids. |
|---|---|---|---|---|
| 1 | 7.60 per cent. | 15.0 per cent. | —— per cent. | 52.1 per cent. |
| 2 | 7.47 " | 14.9 " | 28.0 " | —— " |
| 3 | 4.85 " | 17.3 " | 15.3 " | —— " |
| 4 | 3.23 " | 20.67 " | —— " | —— " |
| 5 | 1.95 " | 21.87 " | 15.5 " | —— " |
| 6 | 1.10 " | 24.60 " | 15.5 " | —— " |
| 7 | .896 " | 22.26 " | —— " | —— " |
| 8 | .742 " | 22.22 " | —— " | —— " |
| 9 | .580 " | 20.40 " | —— " | —— " |
| 10 | .506 " | 18.15 " | 15.6 " | 52.35 " |

I. Total extract contained 16.45 per cent alkaloids.
II. " " " 17.00 " " "

From these returns it may be assumed :—That the relation of alkaloids to extractive is not constant in exhausting nux vomica, and that, up to a reasonable limit, the total extract increases in strength slightly as the percolation proceeds.

The relation of the alkaloids to each other is the same in the drug in all fractions of the percolate and in the unexhausted marc.

That the oil is removed most readily by first fraction of percolate.

That the value of a well-prepared extract is 16.5 per cent or more of total alkaloids.

Upon a basis of 2 per cent dry extract the tincture should contain not less than 0.320 per cent alkaloids, a better average being near 0.335 per cent.

The object of this note is to show that the standard to be adopted should be within or near these limits, and the necessity for adopting some more definite basis is made more apparent by the tendency, among the larger producers at least, to degrade the tincture by erecting low standards of strength, as little as 0.265 per cent total alkaloids having been assumed as a safe basis.

In conclusion, the writer wishes to acknowledge obligations to Prof. Lloyd for a part of the material used in preparing this work.

* Read at the meeting of the Ohio Pharmaceutical Association, in answer to Query 48: Is the relation of alkaloids to extractive constant in exhausting nux vomica—that is, will the tincture be exactly the same (when adjusted to 2 per cent of extract) whether extraction be complete or incomplete?

## Commercial Chloride of Lime.*

(Chlorimetric Assay.)

BY EUGENE A. AND J. G. SPENZER.

FOUR samples of package chloride of lime and one of fresh bulk were examined, after Fresenius' modification of Penot's method (Fresenius, "Quant. Chem. Analyse," 6te Aufl., II., 320).

It is based upon the conversion of arsenious acid into arsenic acid, being effected in an alkaline solution; starch-and-iodide-of-potassium paper is employed to ascertain the end reaction.

The arsenious acid solution, from the danger of deteriorating unless perfectly pure, was freshly prepared; each C.c. of this solution contains 0.004436 Gm. of arsenious acid, corresponding to 1 C.c. of chlorine at 0°C. and 760 Mm. barometer pressure.

The chloride of lime solution is made 10 Gm. to the liter, each C.c. representing 0.01 Gm. of chloride of lime; 50 C.c. of this solution were used at each trial.

The number of C.c. of arsenious acid solution used, multiplied by 2, gives the chlorimetric degrees, which multiplied by 3.17763 gives the percentage of chlorine in the chloride of lime, viz.:

| | Degree. | Multiple. | Percentage. |
|---|---|---|---|
| 1 C.c. of arsenic solution required | 42.6=85.2° | ×3.17763 | 27.07% |
| 2 " " " " " | 42.4=84.8° | ×3.17763 | 26.94 |
| 3 " " " " " | 42.2=84.4° | ×3.17763 | 26.81 |
| 4 " " " " " | 41.6=83.2° | ×3.17763 | 26.43 |
| Bulk " " " " | 33. =66° | ×3.17763 | 20.97 |

Only in the sample of the bulk did it fall below the pharmacopœial per cent (at least 25 per cent).

## Glycerin—Vegetable and Animal.†

BY J. GEO. SPENZER, OF COLUMBUS, O.

THAT in comparative examinations it is necessary to procure and operate on the examined substance under like conditions as regards quality, grade, etc., determined by price and history, is self-evident, else the results would possess no special significance, nor would they tend to a comparison.

Below are given reasons why in the present case this could not be done in as desirable a manner as was wished.

While it is not probable that a manufacturer would mix

* Read at the meeting of the Ohio Pharmaceutical Association.

† Read at the meeting of the Ohio Pharmaceutical Association, in answer to Query No. 20: Commercial glycerin is now obtained from two sources, vegetable and animal fats; is that from the former source superior to that from the latter?

glycerin made from vegetable fat with one prepared from animal, and while in crude glycerin impurities do exist which allow of the discovery of its source or the process by which it was made, these clues are almost, if not entirely, removed in distillation and redistillation.

In the manufacture of stearin candles a mixture of palm oil and tallow is used, resulting in a mixed or animal and vegetable glycerin. In the manufacture of soap this is also often the case, while since much of the crude glycerin distilled in this country is imported, it is undoubtedly of the same mixed origin. The examination includes three samples of vegetable and two of animal (tallow) glycerins.

| Glycerin. | Vegetable. | | | Animal. | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Specific gravity, 17.5° C. | 1.2557 | 1.2556 | 1.2582 | 1 2525 | 1.2568 |
| Absolute glycerole, 15° C. | 97% | 97% | 98% | 96% | 98% |
| Formic acid | None | None | None | None | Very faint trace. |
| Butyric acid | " | " | " | " | " |
| Acrylic acid | Trace | Trace | " | " | Trace |
| Higher fatty acids | None | None | " | " | " |

In freedom from color, odor, metals, and adulterations, they conformed to the Pharmacopœia; all were neutral to litmus.

The results, as they are, are not entirely satisfactory, because of the limited number of samples, occasioned by the difficulty of finding a strictly animal glycerin; as it stands, the results are creditable to the animal glycerin, since it costs one-fifth the price, is sold in cans, and is therefore not of the same grade; a sample of the same grade was unobtainable.

It is difficult to see why a glycerin made from nice, clean tallow is not as good as that from vegetable oils.

Wm. H. Clark (*Am. Jour. Pharm.*, 1887, p. 608) considers them to be equal in quality.

**Test for Antipyrine.**—The now well-known reaction between nitrous acid and antipyrine can be utilized as a test for antipyrine in the following manner: Place in a test tube a few grains of potassium nitrate, add a little water and then an excess of strong sulphuric acid, and fill the tube with the suspected liquid. A green coloration is immediately produced if antipyrine be present.—A. C. Stark, in *Pharm. Jour.*

## APPARATUS FOR FRACTIONAL DISTILLATION IN A PARTIAL VACUUM.

For fractional distillation in a partial vacuum, J. W. Bruehl recommends the following apparatus, a diagram and description of which are given above:

A is a glass cylinder connected at *a* with the vacuum apparatus and provided with a ground edge, on which rests the glass cover B. The tube *c*, which is connected with the distilling apparatus, passes through an india-rubber cork fitting tightly into the tubulure *b*. A glass rod, *e*, provided with a handle, passes through an india-rubber cork tightly fitted into the tubulure *d* almost to the bottom of A, and at a short distance from the lower extremity is pierced with a hole in which is pressed a pin, *i* (Fig. 2). *f*, *g*, *h*, consists of a hollow stem, *f*, to which the discs *g* and *h* are attached; it is made of ebony and can be fastened on to *e* by means of a bayonet-shaped catch.

Test tubes having been placed in the holder *f*, *g*, and *h*, the rod *e*, to which the cover B is attached, is fitted into the stem *f*; the two portions, made fast by means of the catch, are placed in A, and the apparatus made air-tight by pressing the greased edges of A and B together. The distilling vessel is then made air-tight, *a* is connected with the vacuum apparatus, and the distillation proceeded with; by turning the rod *e* the receiver can be changed at will. It is unadvisable to move the india-rubber stoppers after they have once been placed in position, but when the central one requires replacing, the pin in the glass rod can be easily removed.

The air-bath (Fig. 3) can be advantageously employed for all distillations.

The flask is suspended in a hemispherical metal basin so that it does not touch the bottom or sides, and is covered by an asbestos cone, which is provided with a radial slit and a circular opening to admit the neck of the flask. The temperature can be regulated and kept constant quite as easily as when a water-, oil-, or any other liquid-bath is employed. For high temperatures the metal refractor shown in Fig. 3 is fixed on the Bunsen lamp.—*Berichte* and *J. Soc. Chem. Ind.*

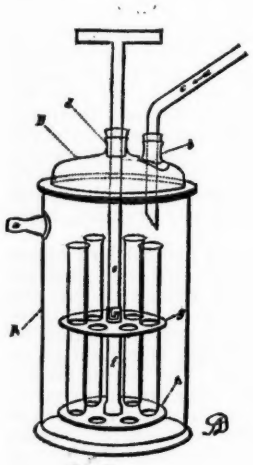


Fig. 1.

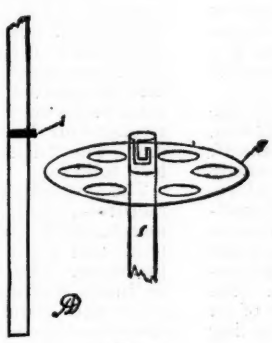


Fig. 2.

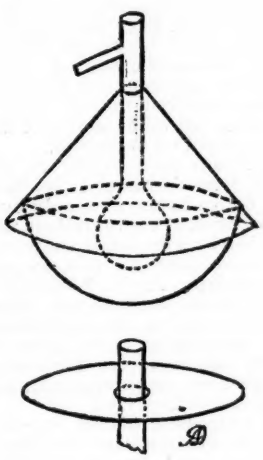


Fig. 3.

Apparatus for Fractional Distillation.

## Cantharidin in Pharmacy.*

BY PROF. F. A. GRAZER.

The use of cantharidin in pharmacy has been very limited, as far as I have been able to determine, although quite a number of methods have been recommended for separating this principle from the flies. Most of these have been used, no doubt, with a view of determining the quality of the flies, their value being estimated by the amount of cantharidin, and as a matter of experiment.

My attention was attracted to the use of cantharidin while making some cantharidal collodion. I noticed how easily this principle could be separated by the method adopted in that process. In the preparation a considerable amount of cantharidin remained undissolved by the collodion, even after agitation for several days.

It occurred to me that it would require but a little extra labor to remove the fatty matter with carbon bisulphide, and obtain the cantharidin in a tolerably pure state, by which the quality of the drug used might be estimated, and at the same time a collodion, prepared of a known strength, by simply adding the cantharidin to the requisite amount of flexible collodion. A preparation made in this manner yielded satisfactory results.

A short time after this I was called upon to make some vinegar of cantharides according to the British Pharmacopœia. I found the process a tedious one, especially that part of the process requiring percolation, which was exceedingly slow and unsatisfactory. A preparation equally efficacious was readily made by simply dissolving cantharidin in a mixture of glacial acetic and ordinary acetic acids, corresponding to the menstruum used in the preparation.

While I have not made any further experiments, I might suggest its use in the liniment of cantharides, and the cerate of the extract of cantharides. Referring to the last-named preparation, I have often wondered why the Pharmacopœia is burdened with two cantharidal cerates. The plain cerate of cantharides, if properly made with a good specimen of powdered flies, seldom fails to give satisfaction. The claim for the cerate of the extract is, that it is an elegant and efficient substitute for the ordinary cerate, as the greater portion of the inert matter is removed in the process adopted for its preparation.

The object of this preparation, therefore, is simply to

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

remove the vesicating principle in as pure a state as possible, and to combine it with a suitable base. The process is somewhat cumbersome to the druggist, as it involves percolation, distillation, and evaporation, the final result being the removal of the cantharidin, associated with a considerable amount of extractive. A more simple method would be to add a chloroformic solution of cantharidin to a melted mixture of wax, lard, and resin, or the cantharidin may be dissolved by means of heat, in a mixture of rape-seed and castor oil, and then added. In doing this it would be necessary to diminish the amount of lard, as the oil would render the cerate too soft.

But is this elegant and efficient substitute an improvement over the ordinary cerate? So far as I can learn such is not the case. If the objection to this preparation be the mechanical admixture of the powdered flies, I hardly think it justifiable, as these small particles of the hard exterior parts of the insect have a tendency to irritate the skin, and thereby facilitate the vesicating action.

I had occasion, some time ago, to test the relative merits of these two preparations. The cerate of the extract failed to give the satisfaction which the cerate had previously given. That the former preparation contained sufficient cantharidin there could be no doubt, as, six months after its preparation, I found the entire surface thickly studded with cantharidin crystals.

Cantharidin dissolved in oil has been used in Germany. In the last issue of the *Pharmaceutische Rundschau*, New York, May, 1889, a process is given for making cantharidal oil, as formerly recommended by E Dieterich, Helfenberg, Germany. It was made by dissolving three parts of cantharidin in two thousand parts of rape-seed oil. It has been shown by F. Eger that a portion of the cantharidin in the preparation is precipitated after a time, and he recommends the use of castor oil. The following formula is suggested for a permanent preparation: 0.3 Gm. of cantharidin is dissolved in 20.0 Gm. of castor oil and 40.0 Gm. of rape-seed oil by means of heat, after which 140.0 Gm. of rape-seed oil are added.

The main objection to the use of cantharidin is its expense. In Merck's Index 1 Gm. is quoted at $2. It can, however, be made more cheaply by the druggist himself.

The separation of cantharidin is not difficult; it is easily accomplished by percolating the powdered flies with chloroform. I have used for this purpose a narrow Whitall-Tatum percolator, in the bottom of which a cork was inserted, containing a glass tube drawn out to a fine point and curved upward. In this manner I was able to prevent the percolation from going on too rapidly. The chloroform was recovered for future use by means of an old style alembic, connecting with an empty bottle, acting as a receiver and kept cool.

With a water-bath placed over an ordinary spirit lamp the distillation can be carried on until the greater portion of the chloroform is recovered. The fat can be removed after evaporating the remaining chloroform by means of carbon bisulphide or petroleum ether. In this manner it may be obtained sufficiently pure for pharmaceutical purposes. The powdered drug as found in this market is generally good, containing about 8% of moisture and a fair yield of cantharidin.

Other processes have been recommended, such as treating the flies with alkalies and subsequently with acid before using chloroform or ether, by which means a larger yield is obtained. Perhaps the best method is that of dialysis recommended by E. Dieterich. But as far as the commercial article is concerned, it is yet too expensive to be used, at least in this country.

I would, therefore, recommend the druggist to prepare it himself, as I believe that cantharidin could be used in a number of the pharmaceutical preparations now kept in the stores, thereby saving considerable time, besides securing preparations of known strength, which is always an object to be desired.

San Francisco, May 1st, 1889.

### Manufacture of Oleomargarin.

The following description is taken from the Report of the U. S. Commissioner of Internal Revenue. The ingredients used are: Oleo oil, neutral lard, some liquid vegetable oil—as cotton-seed, sesame, or peanut—butter in the higher grades, cream and milk, together with salt, and annatto or other coloring matter.

The manufacturer of oleomargarin usually buys the refined materials in the open market. The manufacture of oleo oil is generally carried on in connection with the large slaughter and packing houses situated in or near the principal cities. The caul and suet fats are removed from the freshly slaughtered beeves and placed in tanks filled with water at 75° to 85° F., where they remain from two to three hours before being transferred to other tanks containing iced water. By this procedure the fats are gradually deprived of their animal heat, and the danger of their becoming rancid is avoided, as would happen if the mass of fat were suddenly chilled by being placed directly in iced water. The caul, long or slaughter fat, is kept separate from the suet fat, which yields an inferior grade of oil.

A Texan steer will yield on an average 65 lbs. of caul and suet fats, from which are obtained 28 lbs. (43 per cent) of oleo oil, 21 lbs. (32 per cent) of oleostearin, and 12 lbs. (20 per cent) of high-grade tallow. The chilled fat, after thorough washing from blood, is fed into hashers working at high speed, from which it issues through fine sieves into the rendering tank. No fat remains on hand longer than fourteen hours, usually not more than four hours, before being rendered. The rendering tank is a steam-jacketed upright kettle of 2,000 to 5,000 lbs. capacity, provided with revolving blades. Steam being let into the jacket, the hashed fat is continuously fed in, and kept in motion by the stirrer. When the tank is full and the contents thoroughly melted, the temperature being 120° to 150° F., the fat is allowed to rest for the water and scrap to settle. The clear fat is drawn off from the top and run into the graining on seeding cars of 400 to 600 lbs. capacity. The temperature of the room in which these cars are stored is maintained at 85° to 95° F., and the whole contents of the car will be in a semi-solid condition in from one to three days. This fat is free from all "greasy" taste. It is now taken to the press room, kept at 70° to 80° F., where it is ladled out on a stout linen cloth, which is folded up ready for placing in the screw-press. When the press is filled, pressure is gradually applied, and the expressed oil constitutes the "oleo oil." This liquid fat is allowed to cool in barrels, and at ordinary temperatures forms a soft, granular, tasteless, and nearly colorless fat. The hard fat remaining in the filter bags forms the beef or oleostearin, which is used for making "refined lard" by the addition of cotton-seed oil, or is sold to the soap and candle maker.

The manufacture of "neutral lard" is conducted by essentially the same machinery and at about the same temperature as for oleo oil, but only the leaf fat of freshly slaughtered hogs is used. A hog yields from 5 to 15 lbs. of leaf lard, of which 100 lbs. yield 90 lbs. of "neutral." The screw-press is not employed to separate the stearin, but the melted fat is run directly from the rendering tank into a very strong, iced brine, where it remains for twenty-four hours before being placed on shelves to dry. The "neutral" is a white, slightly granular, tasteless, solid fat.

The by-products of the oleo oil and neutral lard manufacture—namely, stearin, tallow, and lard—are standard merchantable articles. Only fresh and sweet fats are used, and great cleanliness is observed through all the processes. The vegetable oils employed are refined by ordinary methods, whereby a product of a light straw color and bland taste is obtained. The butter used is always selected for its high flavor. The granular character of oleo oil requires the addition of a softer fat, such as neutral lard or cotton-seed or other vegetable oil, in order to approach more closely to the consistency of butter. The proportions in which these ingredients are used vary with the season of the year, the grade desired, and the formula of the manufacturers. The charge of milk or cream, however, is the same for all grades manufactured by any particular factory, and varies from 10 to 20 per cent. The milk or cream is allowed to become slightly sour.

The mixing of the materials to form the butter substitute is conducted in a steam-jacketed churn of from 1,200 to 2,500 lbs. capacity. The oleo oil and neutral lard are melted in separate vessels at 90° F. The charge of milk or cream is first run into the churn, and the paddles are kept in motion until the butter begins to form. Then the oleo oil is added and stirred, next the neutral lard, and finally the annatto to give the desired color. The butter is either added to the churn or worked in subsequently. The temperature is carefully regulated, beginning at about 85° F. and increasing gradually to 105° F. at the end of the operation, when the whole charge has the appearance of a yellowish, creamy fluid. From twenty to ninety minutes are occupied in the churning. The finished charge is run into tanks containing chopped ice and constantly stirred, or is met by a stream of iced water as it issues from the churn, the object being to give the mass a fine grain by the sudden cooling. The chilled mass is then placed on wooden trays to drain. Here the salt is added and allowed to work itself in, which generally takes from twelve to twenty-four hours. The salted mass is then thoroughly worked by mechanical rollers to remove the buttermilk and water.

Oleomargarin is placed on the market either "solid packed" or in prints or rolls. Four grades are generally made, known as "dairy" and "extra dairy oleomargarin," "creamery" and "extra creamery butterin," the last two containing from 10 to 25 per cent of the best creamery butter; in the lower grades, from 25 to 60 per cent of neutral lard, 20 to 50 per cent of oleo oil, 5 to 25 per cent of vegetable oils, and in some cases from 2 to 10 per cent of butter, with 10 to 20 per cent of milk or cream, are the proportions used. Some factories employ no vegetable oils in their oleomargarin, preferring to use a larger proportion of neutral lard with a small amount of butter to obtain the desired butter consistency. In the higher grades the proportions of oleo oil are reduced, the vegetable oils are discarded, and creamery butter is used to make up the charge.

## Tests for Impurities in Alcohol, and Quantitative Estimation of the Latter.*

### I. *Tests for Water.*

1. On adding a small amount of finely powdered, fused carbonate of potassium to aqueous alcohol, and shaking, it becomes damp if the alcohol contains not less than about 98 per cent of absolute alcohol. In presence of more water it melts.

2. Alcohol over 98 per cent is miscible in all proportions with carbon disulphide. At 98 per cent, it is only miscible with an equal volume of this liquid, and, if of lower percentage, with a proportionately less quantity (Barfoed).

3. Faintly ignited sulphate of copper, when added to anhydrous alcohol, remains perfectly white. In presence of water, and shaking, it gradually acquires a blue color, which appears the more quickly the more dilute the alcohol is.

4. On adding a drop of alcohol containing 3 per cent of water to 3 or 4 C.c. of benzol, the liquid remains clear. If between 3 and 7 per cent of water is present, a cloudiness appears; if over 7 per cent, droplets separate. On dissolving 1 C.c. of benzol in 2 C.c. of absolute alcohol, it requires the addition of 10 C.c. of an alcohol containing 70.9 per cent by volume before a permanent cloudiness appears (Hager).

5. If paraffin oil is dissolved in absolute alcohol or in anhydrous chloroform, and this solution mixed with a few drops of an aqueous alcohol, the liquid at once becomes turbid; $\frac{1}{5000}$ vol. of water may thus be still detected (L. Crismer).

6. Heat a mixture of 2 parts of citric and 1 part of molybdic acid to incipient fusion, dissolve the dark blue mass in water, and saturate with this solution some strips of white filtering paper. On drying the latter at 100° C., they show a blue color, which is immediately destroyed if the strips are dipped into an aqueous liquid. Absolute alcohol does not alter the color, but the more water it contains the more rapid will be the discharge of color (C. Mann).

7. On adding a little sodium amalgam to 0.001 Gm. ($\frac{1}{64}$ grain) of anthraquinone, and then some absolute alcohol, a liquid having a fine green color is produced. On shaking this with air, the green color disappears. But if the alcohol is aqueous, there appears, particularly on gently moving the liquid about, a handsome red color around the sodium amalgam. On shaking with air, the tint disappears, but returns upon standing.

### II. *Tests for Methyl Alcohol.*

(The method of Riche and Bardy is omitted here, as it is too circumstantial.)

8. Method of P. Cazeneuve and S. Cotton. This is based upon the action of permanganate of potassium. Ten C.c. of the alcohol are mixed, at 20° C., with 1 C.c. of solution of permanganate of potassium (1:1,000). Pure ethylic alcohol reduces the latter in about 20 minutes, turning the liquid yellow. In presence of wood spirit, the reduction takes place at once. If the alcoholic liquid to be examined contains sugar, it must be distilled off and the distillate examined as directed before. If ethereal oils are present, as in a brandy, about 40 C.c. of the latter are shaken with two successive portions of 20 C.c. of purest olive oil. The latter being separated, the alcohol is filtered through a double wetted filter. If no sugar is present, the permanganate test may be at once used. In presence of sugar, it is necessary to distil (Habermann).

### III. *Tests for Amylic Alcohol (Fusel Oil).*

9. Evaporate the alcohol at 60° C. and examine the residue as to its odor (Nessler and Barth).

10. Into a glass tube, 7 to 8 inches long, $\frac{5}{8}$ inch wide, and open at both ends, push a roll made of filtering paper about 6 inches long. If the suspected alcohol contains more than 60 per cent of absolute, dilute it with an equal volume of water, mix it with a little glycerin, and saturate the paper-roll with this liquid. Allow the tube to stand 15 minutes first in an upright, then in a horizontal position, at a temperature of 25° C. When the alcohol has evaporated (after 24 to 48 hours), any amylic alcohol present (even in traces) would be revealed by the odor (Hager).

11. Dilute 5 C.c. of the alcohol to be examined with 6 to 7 times its quantity of water, add 15 to 20 drops of chloroform, and shake. The chloroform dissolves the amylic alcohol. On separating the chloroform and cautiously evaporating it in a capsule, the amylic alcohol will remain behind, and may be recognized by its odor or reactions (C. Betelli).

To determine fusel oil quantitatively, 100 C.c. of the alcohol are put into a flask of the capacity of about 200 C.c., and the contents distilled on a water-bath. The neck of the flask, together with the distilling tube (of about $\frac{1}{4}$ inch diameter), should project 8 inches from the mouth of the water-bath. During the distillation the fusel oil remains wholly within the flask, and may be weighed therein. If larger quantities of alcohol have to be distilled, owing to the small proportion of fusel oil, the distilling flask is provided with a little funnel for periodically refilling it. Should the alcohol contain less than 70 per cent of absolute, a portion of the water will remain behind with the fusel oil. In this case a little *pure* absolute alcohol is added to the residue, and the distillation repeated (Hager).

According to Uffelmann, the fusel oil may be approximately determined quantitatively as follows: Mix 250 C.c. of the alcoholic liquid (for instance, brandy) with 100 C.c. of ether, shake, add water, remove the ethereal layer, and again shake with 100 C.c. of ether. Evaporate the ethereal extracts to about 40 C.c., add a few C.c. of freshly prepared *green* solution of methyl violet (made by dissolving 1 part of methyl violet in 100 parts of water, and adding enough of 2 per cent hydrochloric acid to just turn the liquid green), and set it aside in a graduated tube of 1 inch diameter. As soon as the ether shows a bluish tint, and the spectroscope still reveals the absorption band, at D, of methyl violet, the quantity of ether is read off. Every 10 C.c. of this contain then 0.2 C.c. of amylic alcohol.

### IV. *Test for Aldehyde.*

Mix 1,000 C.c. of solution of fuchsine (1 in 1,000) with 20 C.c. of solution of bisulphite of sodium, spec. grav. 1.260, and add 10 C.c. of concentrated hydrochloric acid. One C.c. of this reagent is mixed with 2 C.c. of the alcohol, brought to a percentage of 50. If aldehyde is present, a more or less deep red color will be produced. By making parallel experiments with alcohol containing known proportions of aldehyde, the amount present may be approximately determined.

### V. *Test for Furfurol.*

Mix 10 C.c. of the alcohol to be examined with 10 drops of colorless aniline and 2 to 3 drops of hydrochloric acid. If furfurol is present, a red color is produced. If only traces are present, the alcohol is mixed with an equal volume of water, shaken with chloroform, and the residue treated with aniline and hydrochloric acid as above (K. Jorissen).

A mixture of equal volumes of xylidine and glacial acetic acid, to which a little (pure) alcohol is added, acquires an intense red color with the least traces of furfurol. Or a strip of white filtering paper may be impregnated with the mixture, and then exposed to the vapors of the liquid in which furfurol is to be looked for (H. Schiff).

### IV. *Determination of Organic Bases in Commercial Alcohol.*

Crude commercial alcohol, chiefly that made from potatoes, often contains small quantities of volatile organic bases containing nitrogen. These may be converted into ammonia by Kjeldahl's method. One-half to 1 quart of the alcohol are diluted to 50 per cent, mixed with 20 Gm. of sulphuric acid, shaken for some time, and then the alcohol and water distilled off; 0.5 Gm. of metallic mercury is now added, the whole heated nearly to boiling for 1 or 2 hours, and then diluted with water. Sulphide of potassium and solution of potassa are now added, the ammonia driven out by boiling and caught in a known quantity of volumetric sulphuric acid.

### VI. *Quantitative Determination of Ethylic Alcohol.*

The quantitative estimation of ethylic alcohol is accomplished by determining either the specific gravity of the alcoholic liquid, or the number of drops in a definite volume, or the quantity of permanganate required to completely oxidize it.

These three methods presuppose that the liquid contains nothing else but alcohol and water.

The first method is so well known that it need not be explained here.

The second method, devised by Traube, is one which is not generally accepted as reliable, and may therefore be passed over.

The third method, by permanganate, devised by Br. Röse, is performed as follows:

Dilute the alcoholic liquid to about 1 per cent of absolute, transfer 5 Gm. to a small flask, add 50 C.c. of solution of permanganate of potassium containing 10 Gm. of the salt in 1 liter, and add, by means of a pipette, 20 C.c. of concentrated sulphuric acid under constant agitation. After one minute dilute with about 100 C.c. of water, and decompose the remainder of the permanganate by more than a sufficient quantity of the volumetric solution. Heat to boiling and complete the titration by standard permanganate.

To completely oxidize 1 Gm. of absolute alcohol there are required 8.244 Gm. of permanganate of potassium.

The author recommends to prepare the oxalic solution, not with oxalic acid, but with quadroxalate of potassium ($KHC_2H_4.H_2C_2H_4.2H_2O$).

The author adds seven other methods for determining alcohol quantitatively, but does not go into details. Most of these methods require special apparatus, and the results are, moreover, not always fully reliable.

* From Part I. of "Anleitung zur chemischen Analyse organischer Stoffe." Von Dr. G. Vortmann, Privatdocent an der technischen Hochschule in Aachen. 8vo. Leipzig und Wien, 1889. (Guide to the Chemical Analysis of Organic Substances, etc.) A very useful work, which we can recommend to all interested in organic chemicals.

### Starch Wax—A New Pill-Excipient.

H. HAGER recommends in the *Pharmaceutische Zeitung* what he terms *Cera Amylata* as an excipient for pills. The mode of its preparation is as follows, it being essential that the substances employed are completely free from water: From pure light-colored beeswax fine lamellæ as thin as thin note-paper are cut with a sharp, thin knife; they are placed in a porcelain dish; the latter is covered with paper to keep away all dust, put into a dark place for five to ten days at the ordinary temperature of the room, to cause evaporation of all inherent moisture. Wax which is several years old requires only two to three days' drying, while fresh wax requires at least ten days. A certain quantity of wax dried in this manner is weighed, also an equal amount of starch; the latter and half of the wax are placed in a porcelain mortar, the inside of which is made rough. Both substances are then carefully and slowly triturated to a powder; afterwards the other half of the wax is added, and trituration is continued until a fine powder is obtained. The latter is passed through a fine sieve and filled into the bottles.

The temperature during trituration should not be above 16° C.; a temperature of 10° to 12° C. is the most suitable. To prevent heating by friction, and formation of small lumps, trituration should never be effected rapidly. Particles sticking to the sides of the mortar or to the pestle are removed with an iron spatula or rounded knife, and again triturated by employing gentle pressure. Starch wax is a white powder of medium fineness, consisting of a mixture of equal parts of yellow beeswax and best pure rice starch. The mixture forms an excellent base for pills and medicated bougies, as its therapeutic action is quite indifferent. Pills made with this preparation are readily digested and completely decomposed in the intestinal tract. Some physicians still seem to entertain the opinion that pills made with wax are not digested; but if wax is mixed with certain substances to such a percentage that the melting point of the mixture is at 50° C., the pills made with this mass do not remain intact but decompose, and are absorbed all the better when a vegetable powder such as starch is added. Five to fifteen pills made of 2 dr. wax, 1 dr. castor oil, ½ dr. balsam tolutan, and 1 dr. radix gentian, each pill weighing 3 grains, were given per day, and yet not a single pill was found on searching the fæces.

Starch wax is indicated in all cases where essential, fatty, or empyreumatic oils or other substances not readily miscible with water, such as extr. filicis, menthol, guaiacol, creosote, have to be transformed into solid substances and shaped into pills. The addition of water or alcohol has, in such cases, to be avoided. Without first being dried, the pills may be coated at once with varnish or collodion. For the patient they offer the great advantage that they do not yield anything to the saliva, and consequently no unpleasant taste occurs. Furthermore, the pills allow of being kept for some considerable time. The heating and melting of the wax, together with the medication, may, when starch wax is used, often be completely avoided, which is of special advantage when the latter is volatile.

Starch wax has to be kept in bottles well stoppered with good corks, in a cool place well protected from day- and sunlight; the powder is odorless. Only when exposed to daylight for some considerable time does it give out a feeble odor of old beeswax; powder which is well kept proves odorless and tasteless even after the lapse of twelve months.

The powder recommended is a mixture of equal parts of wax and starch. Powder made according to this prescription will usually suffice for all purposes where it has to serve as a base for pills. A similar powder may be obtained with two parts of wax and one part of starch, but this base requires the addition of an organic substance for obtaining the proper consistency.—*Br. and Col. Drug.*

### Maceration with Percolation.

PROF. J. U. LLOYD says that his experience is to the effect that it is necessary, in some instances, in order to get the best results, that a moistened powder should macerate for a considerable time before packing it in the percolator. If the material is of large amount, and requires for extraction an aqueous menstruum or dilute alcohol, and is of a ligneous nature, great pressure results from the subsequent expansion. Unless this expansion be accommodated before packing the powder into the percolator, the material, if in considerable amount, will become so compact as to retard the passage of the menstruum, or obstruct it altogether.

Another class in which preliminary expansion is necessary contains, as members, drugs yielding an abundance of the red astringents. Regarding these, Prof. Lloyd remarks: "With several of these, I have found a menstruum composed of considerable glycerin to be best adapted, and a favorite mixture, in my opinion, for many of them is glycerin, 2 parts, water and alcohol, of each 1 part, all by measure. When these powders are moistened with this menstruum, their constituents are so readily abstracted as to form a gummy magma, which, if the powder is immediately packed into a percolator, suspends the operation of percolation, but not by swelling the powder. Indeed, there is an opposite effect, and the powder even *subsides* in the percolator in some instances if in large quantity, settling a considerable distance. This coalescing of the material may form an impenetrable barrier at the bottom, obstructing the act of percolation, which trouble may be avoided by permitting the powder to remain properly moistened for a few hours, then placing it in the percolator without pressure, and without delay starting the percolation. Some powders of this description, among which I would name *Mangifera Indica*, cannot be percolated at all, even with great care, while others, of which *Pinus Canadensis* is a type, by judicious management acquiesce readily.

"Some years ago a set of six glass percolators were made to my order, ten gallons each. Every care was observed in moistening the powders, and allowing them to expand before packing the percolators, but ultimately each percolator burst from expansion of its contents. Some were shattered into small pieces; others split in a line from top to bottom, the rent spreading half an inch or more; none were broken in handling, and none flew into pieces when empty, as glass sometimes does.

"I have learned that in working considerable quantities of drugs, if the powder be fine, and moistened with the proper menstruum and packed tightly, your view is correct. I have also learned that, beyond a certain capacity, glass, which is also desirable in many cases, is an impracticable medium to use for a percolator."—*Western Druggist.*

### The Cinchona Plantations of Java.

FROM a recent report of the Soekaboemi [pronounce "sookaboomi"] Agricultural Society of Java, the *Chemist and Druggist* gives an abstract, from which we take the more interesting portions.

The area under cinchona culture, and the number of trees on the plantations, in Java, are, unfortunately, not given in the returns, but we find that, according to the latest official information, there were, in 1888, 10,622 bouws, or about 18,843 acres (1 bouw = about 1¾ acres), under cinchona culture in Java. The size of the estates differs widely, of course, and the quantities of bark harvested last year in each plantation range from 233,000 lbs. down to 672 lbs. Most of the Java cinchona estates are situated in the western portion of the island—in the so-called "Preangar Regencies" and the Residency of Batavia—and their outturn virtually forms the bulk of the yield of the island. Roughly speaking, we find that Western Java contains 72 plantations, with an actual yield in bark in 1888, so far as the returns go, of nearly 3,300,000 lbs.; Central Java has 19 plantations, returning an aggregate yield of about 400,000 lbs.; and Eastern Java totals up to 24 plantations nominally, with a harvest of about 220,000 lbs. The largest yield of bark obtained on any single private plantation in 1888 was collected on the Soekanegara estate, near Tjiandjoer, in the Preangar, where 233,000 lbs. were gathered: and the smallest at Djasinga, near Buitenzorg, Batavia, which yielded only 672 lbs. It is a remarkable fact that, whereas the highest estimate for the 1888 crop on any single plantation was 179,000 lbs. of bark (on the Soekanegara estate, just mentioned), no less than five estates estimate their yield for 1889 above that figure, the highest—that of the Goenoeng Melati (meaning Jasmine Mountain) estate, in the Preangar—being 270,000 lbs. The average equivalent of sulphate of quinine obtained from last year's crop varies greatly, the highest return having been obtained on one of the smallest estates in Central Java, where the bark analyzed on an average 9.42 per cent of quinine sulphate. Next to this came two small estates, one in Central and one in Eastern Java, the former with 7, the latter with 6 per cent quinine sulphate. The Preangar plantations mostly run from 3 to 4 per cent. It should again be noted that not only do the returns reveal the fact that the estimated yield of bark for 1889 is generally considerably in excess of the actual yield of 1888, but the estimated standard of the bark is also much higher. In 1888, the aggregate estimate of those among the private planters who ventured upon the prediction amounted to 1,860,000, with about 76,590 lbs.* of quinine sulphate, while the actual result was a harvest of 3,171,778 lbs. of bark, containing 122,889 lbs. of quinine sulphate, or an average of 4.14 per cent. For 1889 the estimates are: Bark harvest, 3,600,000 lbs.; quinine sulphate yield, 151,250 lbs.; or, say, an average of 4.20 per cent. The year 1887 was exceptionally humid in Java, and while the moisture was generally favorable to the young plants and those in the nurseries, it had a bad effect upon the old trees and consequently upon the yield of bark.

As already pointed out, the great mass of cinchona grown in Java is produced in the province known as the Preangar Regencies, and occupying the southwestern portion of the island. This province is of a highly mountainous nature, being traversed by two important chains, on the slopes of which, at an altitude of 5,000 to 6,000 feet, and in a temperature rather too low for coffee-growing, the plantations are situated, many of them on the clearings of old mountain forests which have been freed of the high alang-alang grass overgrowing them. The large

*We have altered the figure 7,659 of the original, which is evidently an error, into 76,590.—ED. AM. DR.

Government plantations, containing over 1,500,000 trees in the open ground, are also found in this province at Tirtasari, Tjinieroean, and Nagrak, near Bandong. They produced in 1887 nearly 800,000 pounds of bark; their area is being constantly extended, and the old trees replaced by young ones of richer variety. It is now nearly thirty-five years since the first successful attempt at propagating cinchona was made in Java by Dr. I. K. Hasskarl, a German savant, who had held the position of Government botanist in the Buitenzorg Garden, and Mr. F. Junghuhn, who had already made a great reputation in Holland and its colonies as a naturalist and scientific investigator. Although the former was the man who actually brought from South America, after a long and perilous journey, the plants from which the present cinchona trees in Java have originated, to Junghuhn belongs the credit of having carried the venture to a successful issue, and of having so carefully managed the plantations that, when he relinquished their direction, there were no less than 540,000 plants growing in the open and some 620,000 in hothouses. Exactly twenty-five years ago, on April 24th, 1864, this famous naturalist died at Lembang, in Java, in the centre of the plantations which he contributed to create. Mr. K. W. van Gorkom, one of the subsequent directors of cultures in the Dutch East Indies, in his valuable book on the cultivation of staple products in Java, relates how Junghuhn's grave is placed at the crossing of the two principal avenues of succirubra trees in the Lembang plantation, a white needle which has been erected over the burial place being visible at a great distance. In Junghuhn's time two cinchona plantations were also commenced in other parts of Java—viz., Bezoeki in the extreme east, and on the high mountain plateau of Dieng, in Malang, one of the loveliest districts of the island—but neither appears to have been successful.

As regards the cinchona estates belonging to private owners, the report which we have quoted makes mention of two cinchona plantations at Lebak, in the residency of Bantam, but only one of these has sent in a return, and this shows the undertaking not to be of any special importance, the 1888 crop having been only 38,000 pounds.

The first attempt at planting cinchona by a private individual was made in Java in 1866 at Garoet, in the Preangar, a district in which, according to the returns, there are now no less than eleven plantations.

The largest and richest plantations are found in Bandong and Tjiandjoer, the former district containing no less than seventeen and the latter fourteen plantations. The remaining Preangar plantations are found at Soemedang (one), Tasikmelaja (three), and Soekaboemi (five), the latter place being the seat of the Agricultural Society, which was founded, we believe, a few years ago for the promotion of the interests of the Java planters. In the adjoining residency of Cheribou, two plantations have been commenced, but neither of them has yielded any crop as yet, though it is expected that they will produce an aggregate of about 17,500 pounds of 3 to 4½ per cent bark this season.

The plantations in Central Java are nineteen in number, but only four are of any great importance, the foremost among these being the Pagilaran estate, which in 1888 yielded nearly 200,000 pounds of 6-per-cent bark. This estate, with four others, is situated in the residency of Pekalongan, where is found the famous "valley of death," filled with nitrogenous exhalations for some feet above the surface of the ground, and fatal to animal life. Pekalongan is also known as a sugar-producing district. It has been frequently pointed out that, in the present state of the cinchona market, the only salvation for the planter lies in the production of a bark of very high quinine standard, and this is now generally recognized by the Java planters. The two richest plantations in the whole island are found in the Pekalongan residency—one of them, the Karang Mego estate, having in 1888 yielded a bark averaging 9.42 per cent of quinine sulphate, while another produced 200,000 pounds of 6-per-cent bark. In the residency adjoining Pekalongan—that of Samarang, the capital of which, of the same name, is the third most important trading port of the island—there are four plantations, one of which (Langenardjo) produces a very rich bark. The cinchona plantations here, however, are not of much extent, except one at a place called Ambarawa, where the 1888 crop was about 26,500 pounds of 5½-per-cent bark. With one more exception—that of the "Mij Bagelen" estate at Ledok—all the remaining plantations in Central Java are not as yet of much account.

In Eastern Java, which embraces some of the most fruitful and also some of the wildest parts of the colony, there are at present four or five large plantations and several smaller ones, while a few have been abandoned, their cinchona trees in some cases proving almost valueless, while in others the trees have been uprooted to make way for the more profitable coffee cultivation. In the Kediri residency there are eight plantations, but not one of them appears important. In Soerabaya, a residency the capital of which is the second largest, if not the largest, trading port of Java, there are thirteen plantations, most of which are situated on the magnificent highlands of Malang, a plateau which is surrounded, as it were, by a circle of volcanoes, including the Smëroe, the highest mountain of Java, rising 13,000 feet above sea-level, and the Bromo, an active volcano, which is regarded with superstitious dread by the Javanese as the haunt of the spirit of the Indian Sea, Ratoe Kidoel.

## HOW TO TAKE PHOTOMICROGRAPHS.

NOTICING in the discussions upon two papers, recently read before the Chemists' Assistants' Association, that an interest was evinced in photomicrography, I thought a short description of a simple and inexpensive apparatus, which, in my hands, has answered every purpose for some years past, might not be out of place in the columns of this journal [*Pharm. Journ.*].

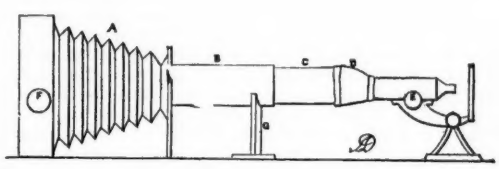
I may state that the apparatus was devised by myself, and although I believe all new apparatus are recorded in the Journal of the Royal Microscopical Society, I know of none so inexpensive, and at the same time so useful, as this has proved itself.

The following diagram illustrating my apparatus is almost self-explaining.

A is the camera; any fairly good quarter- or half-plate camera will answer the purpose.

B is a zinc tube, diameter about 2 or 2½ inches, length 8 or 10 inches. It is fixed by a flange at one end to a board made to fit the front of the camera, in the same way that the board which ordinarily carries the lens is fixed to it.

C is a second zinc tube of about the same length as the tube B, and telescoping into it. The joint must be made light-tight by lining the end of tube B with velvet. The tube C should have a narrow flange at one end. These tubes can be made by any coppersmith.




D is a bag made of at least two thicknesses of velvet. It is fixed, light-tight, over the flange of tube C, by means of tape or elastic. It is also fixed light-tight to the tube of the microscope in the same manner.

E is the microscope. Any monocular instrument will do. It is best used without an eye piece. The better the objective used, the better, of course, will be the photograph.

The *modus operandi* is simple. The object is placed upon the stage in its usual position; when lighted and focussed, the enlarged picture will be thrown upon the screen of the camera.

The adjustment can be made:

1. By the rack and pinion of the camera.
2. By telescoping the tube C into the tube B.
3. By pushing the microscope further into C.

In this manner, an enlarged picture of almost any size can be obtained, for the greater the distance between the objective and the screen, the larger will be the picture. If it is desired to produce a series of photos to the same scale, this can be done by using the same objective at the same distance from the screen in each case.

If one of the objects has been measured and its diameter compared with the diameter of its photograph, the amplification in each case will be the same if the above conditions are adhered to, and it will be unnecessary to repeat the measurement at each distance.

The fine adjustment can be made by the focussing arrangement of the microscope E, but when photographing to *scale* it would be necessary to make the *tube of the microscope* rigid by fixing it to a support similar to that marked G, so that, in focussing, the objective remains immovable, while the stage is free to move in either direction.

A slight inconvenience may at first be felt in reaching to E in focussing; after a little practice this gives no great trouble, and might be entirely obviated by connecting E with a grooved wheel, F, by means of a band, in which case it would be necessary to make both the microscope and the camera rigid.

A strong light is necessary for lighting the object. I have found a good size Hink's duplex lamp answer every purpose. In lighting an opaque object, I direct the light into the object in the same way. For special work a more refined method of lighting might be required, but this plan will be found to answer most purposes.

I do not think it necessary to give details of photographic and microscopic manipulation, as they differ in no respect from those in ordinary photographic and microscopic work.

The cost of adapting an ordinary camera and microscope for this work should not exceed half a crown, whilst a quarter-plate camera suitable for the purpose (which would also be useful for general photographic work) can be purchased for a guinea or upwards.—J. C. SHENSTONE in *Ph. Journ.*

### Donovan's Solution.*

BY E. GOODMAN, PH.G.

THE article in question is one of five years' standing—that is, it has been standing about that long in a shelf bottle, not conspicuously exposed to the light. Incidentally my attention was attracted to it by the deepened color and by a precipitate having made its appearance. Being solicitous to ascertain whether I alone enjoyed such perfect immunity from dispensing so potent a remedy, I canvassed the city on the subject, with the following result: About fifty retail druggists were spoken to in every part of the city, across the river, and in the suburbs to a distance of six miles. Without exception they all said it was very little called for. Some were more specific. One druggist could only recall two prescriptions for it in five years; another made up a pint three years ago and had it all yet; still another had last made it about six years ago, and had some of it still. I feel safe in asserting that the demand for it per druggist in our vicinity would not average one a year.

Several physicians were also asked whether they prescribed it often. Quite a number answered that they gave Fowler's Solution the preference; another thought that the efficiency of the arsenical preparations was overrated, and he seldom used them; one was found whose patient had increased the dose from five to twenty drops without deleterious effects, and still another used it as an ingredient in his "sarsaparilla" for the market.

With these preliminary remarks on the frequency of its use, let us now consider the preparation itself. The specimen in question had precipitated mercuric iodide, had darkened to a brownish-yellow by the liberation of iodine, and consequently the arsenic was converted into arseniate. I am aware that the mention of these changes is not in the nature of a revelation, but my object was to ascertain the *extent* of the changes. The supernatant liquid was filtered from the precipitate and each weighed. The filtrate weighed 255.14 Gm., while the mercuric iodide, after being perfectly dried on the filter, weighed .1134 Gm., amounting to a loss of mercuric iodide of nearly 4.5 per cent. The amount of free iodine was volumetrically estimated at 4.9843 Gm., or nearly 2 per cent. The amount of mercury remaining was gravimetrically estimated as sulphide, and the iodine gravimetrically estimated as iodide, while the arsenic was estimated by difference.

The unstable properties of the solution are directly attributable to the loose affinity existing in the iodide of arsenic, in the commercial article of which the elements are often found partially disassociated, thus introducing free iodine into the solution from the start; this exerts a double action, throwing out of solution a corresponding amount of mercuric iodide.

In the course of my experimenting, I caused about all the mercuric iodide to be deposited from a portion of the solution, by boiling the latter with hydrochloric acid and chlorate of potassium, whereby the iodine was liberated and the red iodide thrown out of solution. The presence of the free iodine also exerts its oxidizing influence on the arsenious acid. The only remedy, of preparing the solution extemporaneously by commencing with the elementary substance, the arsenious iodide, seems impracticable, considering that only two to four drachms are prescribed every year or two in this part of the country. If the points made will have any bearing with the revision committee, in considering whether the remaining followers of Dr. Donovan shall have any further recognition, and, if so, if it cannot be accomplished in a more practical manner, the objects of this paper will have been accomplished.

### Hydracetin or Acetylphenylhydrazin.

AT the close of last year a new antipyretic, called pyrodin, was introduced into therapeutics from Manchester. Professor Dreschfeld, who first reported favorably on this new remedy, shortly afterwards recommended caution in its administration, as it appeared to be a mixture of several substances, and not a pure acetylphenylhydrazin. The pure preparation was said to have four times the strength of pyrodin. Professor Liebreich fixes the single dose for the latter at ½ to 1 grain for children and at 2, or at the utmost 3, grains for adults. He also advises cautious administration until a pure preparation of constant strength is obtainable. Analytical and manufacturing chemists have, consequently, applied themselves to produce and examine new substances containing the acetyl group with other substances in close relation to antifebrin and phenacetin. The complex atom $N\begin{cases}H\\C_2H_3O\end{cases}$ was thought to be the essential basis of the antipyretic action. It forms part of antifebrin, phenacetin, and pyrodin. The close chemical relation of the three substances may be seen from the following formulæ:

$C_6H_5N\begin{cases}H\\C_2H_3O\end{cases}$ Antifebrin. $C_6H_4OC_2H_5N\begin{cases}H\\C_2H_3O\end{cases}$ Phenacetin. $C_6H_5NH{-}N\begin{cases}H\\C_2H_3O\end{cases}$ Pyrodin (Acetylphenylhydrazin.)

* Paper read at the meeting of the Amer. Pharm. Assoc. at San Francisco.

For some time the matter has been dropped, but quite lately Professor Guttmann, director of the well-known Moabit Hospital in Berlin, read a paper to the Berlin Medical Society on his experience with *pure* acetylphenylhydrazin, which had been submitted to him under the name of *hydracetin*. It consists of a white, crystalline, odorless, and nearly tasteless powder, soluble in water in the proportion of 1 in 50; readily soluble in alcohol. Guttmann found the remedy sufficient with eighteen patients suffering from febrile diseases; the temperature abated after administration of 1½ to 2 grain doses. He also treated with the new remedy eight cases of rheumatic fever and two cases of sciatica. The results were very satisfactory. He thinks the new substance suitable for occasional but not for continued administration. The daily dose for an adult (best given in two single doses) should not exceed 10 centigrammes (not quite 2 grains) either in fevers or rheumatism. To continue the administration for more than three days consecutively is unadvisable, as it might produce symptoms of poisoning. The antipyretic action of hydracetin is thought to be in connection with its reducing properties. The latter is proved by several reactions. Permanganate is discolored, metallic silver is precipitated out of a solution of the nitrate, and red suboxide of copper is precipitated even from a cold alkaline copper solution. Based on these reducing properties, a 10-per-cent ointment has been prepared for inunctions, which was very successfully applied in two cases of psoriasis.—*Chem. and Drugg.*

### Ammonia in Distilled Aromatic Waters.

PROF. SCHLAGDENHAUFFEN, of the Nancy College of Pharmacy, while examining some fenugreek-seed water of his own make for its volatile principles, was surprised to observe the characteristic reaction of ammonia and its compounds when adding to the distilled product an alkaline solution of iodohydrargyrate of potassium. On repeating the operation with great care, not only was the same effect produced, but it was equally evident with the water distilled over various other substances. Moreover, upon evaporating the distillates, acidulated with muriatic acid, crystallized ammonium chloride could easily be separated. Fifteen different plants were thus tried, such as pyrethrum tops, mustard seed, angelica seed, peas, beans, orris root, star-anise seed, etc., and afforded a proportion of chloride varying between the minimum and maximum of 0.03 to 1.10 per thousand. Without attaching too much importance to the facts, in the present stage of his experiments, the professor merely suggests that the presence of ammonia in distilled waters must be the cause, or one of the causes, of their alteration on keeping; that it is always to be found in such waters, and they would keep better if this natural food of micro-organisms could be left out.—*Chem. and Drugg.*

### A Hint for Facilitating the Microscopic Examination of Urine.

WHEN attempting to examine urine under the microscope for casts, epithelial cells, and other organic bodies, a good deal of annoyance and difficulty is sometimes caused by urates and also, when the specimen is not quite fresh, by fermentative and putrefactive products. In order to obviate this difficulty, and with the further view of preserving the specimen, Dr. M. Wendringer advises that the urine should be mixed with a nearly saturated solution of borax and boracic acid. This dissolves the urates and keeps the urine from fermenting, and at the same time exercises no destructive effect upon the casts and epithelial elements which it is desired to examine. The solution is prepared by adding 12 parts of powdered borax to 100 parts of hot water, and then adding a similar quantity of boracic acid, stirring the mixture well. It is filtered while hot. On long standing a small deposit crystallizes out, but clings to the side of the vessel, so that it does not interfere with the transparency of the liquid. The urine to be examined is put into a conical glass, and from a fifth to a third of its bulk of the boracic solution added to it and agitated with it. The urine will be found to become clear in a short time—*i. e.*, if there is no cloudiness due to bacteria—and it will remain unchanged for several days. If it is only wanted to clear the urine and to make it keep for a day or two, the addition of a smaller quantity of the boracic solution is sufficient. If a third of its bulk is added, no fermentative or putrefactive processes take place, even if the glass is left uncovered in warm places. Albumen, too, if it exists, is not coagulated. The organic elements—as epithelial cells, casts, blood-corpuscles, etc.—collect so quickly, without undergoing any morphological change at the bottom of the glass, that the first drop taken up by the pipette usually proves a satisfactory specimen.—*Chem. News.*

[Chloroform and chloral hydrate have also the property of preventing fermentative changes and the rapid disappearance of casts under the influence of bacteria. It is the practice of some physicians to add a few drops of eosin ink to any specimen of urine to be examined, for the purpose of staining the casts and rendering them more easily discernible.—ED. AMER. DRUGGIST.]

### Alkaline Mercurial Treatment in Yellow Fever.

DR. GEORGE M. STERNBERG, of the U. S. A., publishes a paper in the *Therapeutic Gazette* (1889, 298), in which he reports that very good results in many cases of yellow fever not too far advanced, had been obtained by administering small doses of bichloride of mercury in conjunction with bicarbonate of sodium The formula which he finally settled upon is the following:

℞ Sodii Bicarbonatis.....gr. 240
Hydrarg. Chlor. Corros.....gr. ½
Aquæ puræ.....fl. ʒ 32

M. Give 1½ fluidounces *(ice cold)* every hour during the day, and every two hours at night.

The quantity of sublimate, as well as the amount of water *(ice cold)* to be added to each dose, will of course vary according to the age, sex, and condition of the patient. The dose above given is that for a male adult of average condition.

### Changes of Acetanilide in the Human Body.

THE urine of patients taking acetanilide (antifebrin) is, as Müller first observed (*Deutsch. med. Wochensch.*, 13, 27), red, from excess of urobilin. The amount of ethereal hydrogen sulphates in the urine is increased, and the urine reduces alkaline solution of cupric oxide and is strongly lævorotatory. K. A. Mörner has more fully examined this subject, the following being a condensed abstract of his results: The urine was evaporated to a syrup, extracted with 90–93 per cent alcohol; to the extract half its volume of ether was added, and then a warm concentrated alcoholic solution of oxalic acid. The potassium ethyl oxalate and the ethereal hydrogen sulphate form a compound which can be crystallized and purified by recrystallization.

On taking antifebrin, a part of it is oxidized to form paracetamidophenol, and is excreted as an ethereal sulphate; whether other similar acids are formed it is not at present possible to say.

The strongly lævorotatory reducing substance is probably a derivative of glycuronic acid. - After *J. Chem. Soc.*

### Examination of Extract of Malt.

SOLID matter is determined in 2 Gm.; the dried extract serves for determination of the ash, and this latter for determination of the phosphoric acid. Free acid is determined by titrating a solution of 10 Gm. of extract in about 50 C.c. of water with semi-normal ammonia, using delicate litmus paper. In order to determine the albuminous substances, 2 Gm. of extract are well dried, and the nitrogen determined by Kjeldahl's method and multiplied by 6.25.

*Maltose.*—A solution of 1 Gm. of malt extract is made up to 100 C.c., and the maltose determined gravimetrically and volumetrically by Fehling's solution. The result is only approximate, owing to the presence of other substances, *e. g.*, dextrin, which reduce Fehling's solution. The error due to the small quantity of dextrin in good malt is, however, not of much moment.

*Dextrin.*—To a solution of 5 Gm. of extract in 25 C.c. of water are added slowly 400 C.c. of absolute alcohol, the whole being kept well stirred. This is allowed to stand for 12 hours and is then filtered; the residue is washed with alcohol dissolved in 60 C.c. of water, boiled, filtered, cooled, and made up to 100 C.c.; 50 C.c. of this are titrated with Fehling's solution. The remaining 50 C.c. are heated for three hours on a water-bath with 0.5 C.c. of hydrochloric acid, then neutralized carefully with caustic soda and titrated with Fehling's solution. The difference of the two titrations is calculated as dextrin.

*Diastase.*—Into a number of test tubes are introduced 10 C.c. of a 1-per-cent starch solution; to the first tube is then added 0.2 C.c. of a 10-per-cent malt extract solution, to the second 0.3 C.c., and so on. The tubes are then heated for three hours to 60° on a water-bath, and are then tested for starch by adding a drop from each to an iodine solution. The percentage of diastase may be ascertained from the fact that one part of diastase decomposes 2,000 parts of starch.—E. DIETERICH in *Helfenberg. Annal.* (*J. S. Chem. Ind.*).

### A New Mydriatic.

SOME recent researches upon hydronaphthylamine by Messrs. Bamberger and Müller (*Berichte*, XXI., 1112) would appear likely to result in another useful contribution from the chemical laboratory to the materia medica. The compound in question bears the systematic name tetrahydro-beta-naphthylamine ($C_{10}H_7H_4NH_2$), and appears, among other interesting physiological properties, to be capable of causing the dilatation of the pupil of the eye in a remarkable manner. According to Professor Filehne, of Breslau, the instillation of a drop of a one to five-per-cent solution causes the dilatation of the pupil of the eye treated only; but dilatation takes place to a strong degree in both eyes as soon as a sufficient quantity—still very minute—has become absorbed in any way; as, for instance, after subcutaneous injection. The pupils are dilated wider than by atropine, and a pupil already dilated by a maximum dose of atropine is still further dilated by this substance. The physiological action of the tetra-hydronaphthylamine is not identical with that exerted by the tropeines in the production of mydriasis, since, when applied locally, instead of paralyzing the contracting muscles of the pupil, as the tropeines do, it stimulates the nerve-endings with the dilating mechanism.—*Pharm. Journ.*

### Note on Cod-Liver Oil.

DR. H. UNGER, of Würzburg, has made further studies on cod-liver oil, which are contained in a paper published in the *Pharm. Centralhalle* (1889, No. 17). He investigated three specimens of oil, prepared in 1888 from the same lot of livers. It was found that cod-liver oil contains albuminate of iron, which is gradually altered or decomposed by fermentative processes. The iron is held in a much more intimate combination than can be obtained by any artificial means.

As a result of the investigation the following facts may be quoted:

1. Cod-liver oil contains manganese. This was found in the ash, amounting to 0.0016 per cent of the oil.
2. The phosphorus contained in the oil, as well as the iron and manganese, are combined with albumen.
3. The albuminoids may be separated from the oil by shaking it with water, or more easily and completely by mixing the oil with water and passing carbonic acid gas through it.
4. Medicinal cod-liver oil should contain the natural albumen compounds in an undecomposed condition.

The author proposes the following pharmacopœial requirements:

Cod-liver oil should be fresh, should contain not more than 4.5% (perhaps this is still too high) of free fatty acids, and, when poured upon nitric acid of spec. grav. 1.400, should exhibit a white zone of albumen after five hours.

### A Ready Method for Emulsions.

HECKER makes some interesting communications on emulsions in the *Pharmaceutische Post.* The use of gum in the shape of a powder, as generally adopted for preparing emulsions, is, according to his experience, not suitable for emulsifying balsams, resins, essential oils, and ethereal extracts. For such purposes he prefers the official mucilage of arabic gum, with the addition of some sugar. Even in the case of fatty oils, such as almond, poppy, and castor oil, when prepared according to the latter prescription, a much more constant emulsion will readily be obtained, and it need not be feared that, after the lapse of twelve hours, the preparation will separate into two layers. The following are the proportions of the different ingredients for 2 drachms of the oil to be taken:

*Castor Oil:* 2 drs. mucilage, 1 dr. powdered sugar.

*Almond Oil*, poppy, olive, cod-liver oil, 2 drs. mucilage, 1 to 2 drs. of powdered sugar.

*Essential Oils:* 5 drs. of mucilage, 2 drs. of powdered sugar.

*Copaiva and Peru Balsam:* 3 drs. of mucilage and 1 dr. of sugar.

The ingredients are, without reference to order, placed in a cup, and stirred with a broad-headed pestle until the peculiar sound of "crepitation" is heard, this being a sure sign that the emulsion has been successfully made. Slowly and gradually water is added. Afterwards the emulsion is poured into a gauged glass containing the other ingredients prescribed. This method of making emulsions is especially convenient for night duty, and for all such cases where rapid making is essential; the preparation of such an emulsion does not require more time than is necessary for making an ordinary mixture. The addition of sugar might be objected to, but an exact following may be assured by subtracting the amount of powdered sugar from the ordinary syrup usually prescribed with such emulsions.—*Br. and Col. Drug.*

### Salol as an Antiseptic.

JUST as antipyrine, after its original application, was found to have numerous other equally effective uses, so it is now with salol, which seems therefore likely to command a more extensive patronage. One of these seems to be really important. The antiseptic properties of the compound have always been recognized, but salol had never been applied externally. Now, however, continuing the parallel with antipyrine—the most important property of which was discovered in a country other than that in which it was first used—salol has been proved to be a valuable antiseptic in France, Italy, and Switzerland. It is specially recommended as a substitute for iodoform, in all cases in which the latter has been previously used, and, considering its freedom from objectionable odor, it is not astonishing that its application in this direction should find favor. Moreover, it is not toxic, which is more or less the case with iodoform. Another advantage is that it is about 20 per cent cheaper than iodoform.—*Chem. and Drugg.*

THE

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OF

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## EDITORIAL.

A RECENT addition to the number of pharmaceutical journals, which is issued in Oregon, contained in one of its first numbers an article by Chas. E. Black, Ph.G., purporting to be original, on the subject of "The Decoration of Drugstore Windows," which was really almost a verbatim copy of an article which first appeared in the AMERICAN DRUGGIST for December, 1884.

While Mr. Black's selection demonstrated the fact of his being a contemptible plagiarist, it also indicated his good taste, for the article as it appeared in the AMERICAN DRUGGIST was one of a series, was prepared by a prominent art critic, and the illustrations which accompanied it were by a well-known New York artist. The whole series attracted such universal attention, both in this country and abroad, that the issues containing them were soon exhausted and a reproduction in book form has been contemplated.

It has been a matter of no little satisfaction to the editors of the AMERICAN DRUGGIST that their efforts in directing the attention of the profession to the desirability of breaking away from the old humdrum methods in regard to the details of drugstore fitting and furnishing, and keeping more closely abreast with the advancing ideas surrounding them in other lines of business, and for the first time broached in the articles mentioned, have been productive of good results, as indicated by the interest these articles created wherever the AMERICAN DRUGGIST was read.

While some of the designs have been widely copied, and many of the ideas practically utilized, it is not surprising that the articles themselves should be caught up by unprincipled scribblers for use as original compositions of their own. But how any well-informed editor could have been so cheaply caught is yet to be explained.

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WE resume, in the present number, the publication of this series of papers, and will give some interior designs which show a very considerable advance in the artistic character of the fittings to be found in recently constructed stores in New York City.

WE occasionally pass stores in which the occupant shows a most lamentable want of taste in disposing his stock to best advantage. Goods which are in themselves attractive are jumbled together with no more regard to the impression that they may produce upon the passer than is shown by the teamster who unloads a lot of building materials, and we are led to wonder that any one can have so little regard for his business interests.

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### American Pharmaceutical Association.

BEFORE going to press we are enabled to give a list of the new officers of the Association who were elected for the ensuing year at the annual meeting at San Francisco:

President: Emlen Painter, of New York. Vice-Presidents: Karl Simmon, of St. Paul, Minn.; W. M. Searby, of San Francisco, Cal.; J. W. Eckford, of Aberdeen, Miss. Permanent Secretary: J. M. Maisch, of Philadelphia, Pa. Treasurer: S. A. D. Sheppard, of Boston, Mass.

We have received an abstract of the proceedings, and also copies of the papers read. A few of the latter will be found in this number. The proceedings in full appear in a supplement to this issue. The next meeting of the Association will be held at Old Point Comfort, Va., on Sept. 8–12, 1890.

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WE are pleased to acknowledge our indebtedness to Secretary Hopp, of the Ohio State Pharmaceutical Association, for copies of the papers presented at the recent annual meeting.

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THE excursionists to the meeting of the American Pharmaceutical Association at San Francisco have evidently every reason to be satisfied with their trip and their reception *en route*. On June 16th, the excursion parties arrived at Denver, and were suitably received by the Denver Association, a committee of which, consisting of Messrs. Scholz, Prowitt, and Dingle, went some distance down the road to meet their guests. Every attention appears to have been paid to the latter, to judge from the reports received. The enterprise of the Denver press is most strikingly displayed by the insertion into their reportorial articles of very characteristic and almost life-like "portraits" of prominent members of the Association. We have no doubt that the collection of "portraits" will be considerably enlarged before the party returns to the East.

### New York State Pharmaceutical Association.

The eleventh annual meeting was held at Binghamton, June 4th to 6th.

An address of welcome was delivered by the mayor, Mr. F. H. Stephens, which was responded to by Dr. J. H. Eaton, of Syracuse. Dr. J. G. Orton welcomed the Association on behalf of the medical profession, and his address was replied to by Dr. A. B. Huested, of Albany. On the first day the president, Dr. R. G. Eccles, read his annual address, which was referred to a committee.

The reports of the several officers and committees were then offered.

Among the latter was the report of the Committee on Adulterations, which was read by Dr. Eccles.

A committee was appointed, consisting of W. H. Rogers of Middletown and J. H. Eaton of Syracuse, to select five candidates to be proposed to the governor of the State for selecting a member for the State Board of Pharmacy.

On the second day, this committee reported the following names: E. G. Dawson, Jr., of Syracuse; F. M. Prank, Middletown; R. E. Phillips, Fulton; C. H. Sagar, Auburn; J. B. Todd, Ithaca. At the same time they recommended that a resolution be passed petitioning the governor to appoint Mr. Dawson, which was carried.

Dr. R. G. Eccles, T. J. Macmahan, and Clay W. Holmes were appointed a committee to represent the Association at the next convention for revising the Pharmacopœia (May, 1890).

The following were elected officers for the ensuing year:

President: Prof. W. G. Gregory, of Buffalo. Vice-Presidents: C. S. Ingraham, of Elmira; Wm. Howarth, Jr., of Utica; C. H. Gaus, of Albany. Secretary: Clay W. Holmes, of Elmira. Treasurer: C. H. Butler, of Oswego. Executive Committee: F. L. Norton, of Delhi; W. L. Du Bois, of Catskill; J. B. Todd, of Ithaca.

The next meeting was decided to be held at Auburn, at a time to be fixed by the Executive Committee. Mr. C. H. Sagar, of Auburn, was appointed Local Secretary.

On the third day several further committee reports were read, and also a number of papers.

During the meeting fifty-three applications for membership were received.

After the new officers had been installed, votes of thanks were tendered to the pharmacists of Binghamton, as well as to others who had extended courtesies to the Association.

The meeting then adjourned.

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**The Ohio State Pharmaceutical Association**, in its meeting on the 4th of June, elected the following-named officers: President, L. Sherwood of Columbus; Vice-Presidents, A. H. McCullough of Mansfield, F. M. Heath of White House; Treasurer, F. A. Kautz of Cincinnati; Executive Committee, P. Acker of Cleveland, J. H. Von Stein of Sandusky, M. A. Burkhardt of Dayton. The next meeting will be held at Toledo on the second Tuesday in June next. The following nominees were chosen for the vacancy in the State Board of Pharmacy: C. Ludlow, Springfield; F. M. Heath, White House; and E. M. Hatton, Zanesville. Article 3 of Chapter III. of the by-laws was amended so as to read: "and the president, upon the report of said committee, shall call for additional nominations."

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**The Wisconsin Pharmaceutical Association** will hold its tenth annual meeting at Portage on the 13th, 14th, and 15th of next month, and the local committee have made provisions for numerous entertainments during the session. Besides the usual business an entertainment will be given on the evening of the 13th by the commercial travellers and members of the Association. On the evening of the 14th there is to be a reception and ball, and on the 15th an excursion will be made by railroad and steamboat to the Dells—a narrow passage cut by the Wisconsin River through sandstone rock for seven or more miles, and noted for its picturesque scenery and curious sights.

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**The School of Pharmacy of the University of Kansas** celebrated its fourth anniversary in Lawrence on the 3d of June, and was followed by the business meeting and banquet of the Alumni Association in the afternoon and evening.

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**The Committee of Arrangements** for the thirty-seventh annual meeting of the American Pharmaceutical Association issued a beautiful forty-page pamphlet describing the matters of interest in and about San Francisco, and profusely illustrated.

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**Fastening for Envelopes.**—To prevent the unwarranted opening of envelopes it is recommended that copper oxide ammonia solution be used instead of gum. This solution has the property of dissolving cellulose, and when applied to paper slightly corrodes its surface. When the paper becomes dry, the fastening is secure. It may also be used for parchment paper. —*Brit. and Col. Drugg.*

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## CORRESPONDENCE.

### Eucalyptus Honey.

EDITOR OF THE AMERICAN DRUGGIST.

SIR:—For some time a doubt has been expressed as to whether the eucalyptus honey sent over from Australia is a natural product, and, as we have taken a large share in the introduction of this article into Europe and the United States, we feel called upon to give, for the benefit of those whom it may concern, all the information we have received up to date.

The first that was heard of this honey in Europe was through the *Progrès Médical* of Paris, August, 1885, in which an article was published by Dr. Caraman-Thomas giving the chemical analysis and therapeutic information he had obtained by personal experience. Since then, however, we received from South Australia a large consignment of the honey, and we have distributed samples in the States and in this country. A doubt, however, was cast upon the nature of this honey, and it was openly asserted that no such product as eucalyptus honey was obtainable in a natural state. Immediately on hearing of this statement, we communicated with competent authorities in Australia with a view to ascertain how the case really stood. Our informant in Adelaide said that he had made inquiries of the chemists, who knew nothing of this honey, and that he feared it was an artificial product probably made up with eucalyptus oil. From Melbourne a more interesting account was sent, reading as follows:

"A few months ago some honey was sent to me for my opinion that was taken from bees that visited the flowers of the *Bursaria spinosa* in Kangaroo country, and which had a strong aromatic taste. Besides, I have often been told that honey taken from bees visiting the eucalyptus flowers has their characteristic taste. My own opinion is that such honey is not extracted from the flowers themselves, but from a manna which very often covers the leaves of the flowering and other eucalyptus trees, especially the *E. rostrata;* and this manna gathers in large drops under the thin, peeling bark, so that it flows away, even covering the ground. This fluid manna has a strong eucalyptus and agreeable taste, and is licked up by the bees and ants. In such cases the honey imparts its taste and aroma to a whole hive. In the olden times of the colony, I have often observed swarms of the small Australian bee (probably related to the *Melipana* of South America) on grass and corn, but was never fortunate enough to find a hive filled with honey, though others have assured me of having done so."

The whole of the information we received has been published in the *British and Colonial Druggist*, April 20th, 1889, of which we forward you a copy by this post. Since this article we have, however, received further and definite information from the shipper of the honey, from which it would appear that eucalyptus honey *is undoubtedly a natural product*, notwithstanding anything that theorists may advance in opposition to it. The statement made by a number of gentlemen of undoubted authority in S. Australia, and who are thoroughly competent to speak on such a subject, leaves no loophole, and we ask you to grant us a portion of your valuable space in order that your readers' minds may be set at rest on this subject. We may inform you that we have been induced to write to you, having received from our friends in the States several letters urging us to reply to paragraphs reproduced in your contemporaries from the *American Journal of Pharmacy*.

Yours truly,

THOS. CHRISTY.

25 LIME ST., LONDON, June 1st, 1889.

ADELAIDE, 6th April, 1889.

We, the undersigned, having visited the apiary of Mr. E. A. Coleman at Fairfield, Mount Barker, have no hesitation in stating that Mr. Coleman's honey crop is gathered entirely from the various eucalyptus trees which grow in his neighborhood.

It is well known that in the wooded districts of South Australia, such as Mount Barker, the bees are entirely dependent during the summer months on the eucalypti for the supply of honey, and that were it not for these trees the honey crop would be a failure. We can also state, from our personal knowledge of Mr. Coleman, that honey from his apiary can be thoroughly depended upon to be in all respects as he represents it; that is to say, an absolutely pure natural product without any admixture whatever.

J. E. RAMSAY, Chief Secretary, S. A. (South Australia).
J. M. A. COCKBURN, M.D., Lond., M.P.
A. WATSON, M.D., Paris and Göttingen, Elder Prof. of Anat., Adelaide Univ.
ALBERT MOLINEUX, Sec. Bureau of Agr.; Editor *Garden and Field;* Agr. Ed. *Observer.*
C. G. GURR, Sec. S. Australian Beekeepers' Association.

### Solution of Citrate of Sodium.

AMERICAN DRUGGIST.

DEAR SIR:—In your May number (p. 100), you gave a formula for sol. of citrate of sodium to contain 7% citrate of sodium, and to take the place of the salt in the National Formulary, under "Tinctura Ferri Citro-Chloridi."

The proportions as given are incorrect, there being not enough sodium bicarb. and a large excess of citric acid.

The citrate of sodium intended is evidently the granular salt, $Na_3C_6H_5O_7H_2O$, and is not the crystallized citrate as given by Remington, $2Na_3C_6H_5O_7.11H_2O$, for a solution prepared to contain 7% of the salt of the last formula will not give the reaction required.

By using the following, a solution can be made containing 7% of the citrate of sodium, $Na_3C_6H_5O_7H_2O$:

| | |
|---|---|
| Bicarb. Sodium, 99% pure | 2,896 gr. |
| Citric Acid | 2,347 gr. |
| Water | 6 oz. |

Dissolve the citric acid in the water, heated gradually. Then add soda gradually, and, when reaction has ceased, add sol. chlor. iron, and complete as per directions in National Formulary.

Yours, FRANK EDEL.

LEAVENWORTH, KAN.

### Filing Prescriptions.

F. V. KNIEST says, in the *Western Druggist* for May, that he has used the following method for filing prescriptions, and found it satisfactory: Beginning with the first 100 prescriptions, pass a very strong piece of twine through their upper right-hand corner, and attach to it, on each side, a heavy piece of card-board a little larger than the prescriptions. Tie the two ends of the twine loosely against the prescriptions, leaving a few inches of the ends. On the outside of both cards write plainly the beginning and closing numbers, also the beginning and closing dates. Construct each succeeding hundred in the same way, and with the ends of the twine connect it with the preceding series. When a thousand have been so arranged, place them in a suitable box, recording on one end the beginning and closing numbers and dates.

## QUERIES & ANSWERS.

*Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.*

No. 2,336.—**Sozodont** (W. W. A.).

According to Schaedler, sozodont consists of the following ingredients: 1. The liquid: 5 parts of castile soap, 6 of glycerin, 30 of alcohol, 20 of water, flavored with a few drops of a mixture of oil of peppermint, cloves, cinnamon and star anise, and slightly tinted with cochineal. 2. The powder: A mixture of powdered orris root, carbonate of calcium, and magnesia.

No. 2,337.—**Morrhuol** (J. C. S.).

Morrhuol is the name given to a sort of "extract of cod-liver oil," in which the reputed useful constituents, such as iodine, bromine, and phosphorus, are accumulated in greater proportion than in the original oil. It is prepared by treating brown cod-liver oil with alcohol of 70 per cent, and removing the alcohol from the separated alcoholic solution by distillation. The product is said to represent the original oil in the proportion of 1 to 30. Morrhuol is recommended in doses of 3 grains, put up in capsules.

No. 2,338.—**Volumetric Solutions** (R. A. R.).

Part of your query has been answered in our last issue, incidentally, while speaking of volumetric sulphuric acid (see p. 119). A fuller reply will be furnished in our next issue.

No. 2,339.—**Sulphuric Acid** (R. A. R.).

We are asked whether there are any other special works on sulphuric acid besides that by Lunge, and whether there are any journals devoted to the subject.

We can mention the following works in English: 1. Lomas, "Manual of Alkali Trade," London, 1886 (ab. $7.50). 2. Lock, "Practical Treatise on the Manufacture of Sulphuric Acid," London, 1879 (ab. $7.50). There are several large works on the subject in German and in French, the titles of which our correspondents may learn by writing to B. Westermann & Co., or G. E. Stechert, of New York.

There are no special journals devoted to the alkali and acid manufacture. But the *Journal of the Society of Chemical Industry* gives account of everything new relating to these subjects, and is probably the best periodical, in English, to consult for those who are interested in the acid trade.

No. 2,340.—**"Bouquet" and "Aroma" of Wines** (K., Ithaca, N. Y.).

"Bouquet" and "aroma," as applied to wines, are not synonymous, though they are closely related. It is rather difficult to give a concise and exhaustive definition of what a connoisseur understands under *bouquet*. But as the property or character to be described by this term is quite definite, we will give as exact a definition as appears to us possible.

"Bouquet," as used of wines, is the total impression produced by a wine upon the sense of odor and taste. This impression is most vivid if the taste and odor of the wine are examined immediately on broaching a cask or opening a bottle, provided the sense of taste and smell of the experimenter is in a healthy, normal condition. Bouquet is not an odor or taste pre-existing in the grape or the unfermented grape juice, but is developed during the process of fermentation and the subsequent ageing of the wine. If the original grape had a decided special odor or taste, such as the muscatelle, Concord, scuppernong, etc., the wine will possess this odor or taste to a certain degree likewise, but this is then called "aroma," not "bouquet." What the substances are which impart "bouquet" to a wine is not known. Certainly they are present only in most minute quantity. While it is possible to deprive grapes of odorous and aromatic principles constituting more or less of their "aroma," by treating them with ether, it is impossible to extract from them any substances which go to make up the "bouquet." These latter occur not only in the grapes, but also in other parts of the vine. The more refined the latter is by cultivation the finer will be the bouquet. A "Riesling bouquet," for instance, has been produced (by Müller, of Thurgau) by allowing sugared water to undergo fermentation upon leaves of a Riesling vine. There is as much variety and "character" among "bouquets" of wines as there is among other classes of odors and tastes. To an uneducated tongue many wines taste practically alike, while a competent judge will readily select from such a series the best qualities, and will not seldom even be able to name the year in which the wine was grown.

No. 2,341.—**Prescription Difficulty** (F. E. E. H.).

This correspondent writes as follows:

"How may the following prescription be best prepared:

℞ Acidi Salicylici ..... ʒ 1
Sodii Boratis..... ʒ 4
Cocainæ Hydrochloratis..... .....gr. 2

"M. Fiat pulvis.

"I find that a reaction takes place, and that a mass is formed which on standing hardens again and can be powdered. I suppose the proper way would be to heat the borax until the water of crystallization is driven out. Or should I notify the physician who prescribed it, and find out if he intended to obtain the above result?"

First, regarding the reaction, we would say that this has long been known to take place between salicylic acid and borax in the presence of water. In 1875, Dr. Bruno Hirsch announced that if 1 part each of these two substances is dissolved in 50 parts of water, the resulting solution has an intensely bitter and persistent taste. On evaporating this solution to dryness on the water-bath, a residue is left, which, excepting a small quantity devoid of bitter taste, is soluble in alcohol of spec. grav. 0.830. The addition of ether to this alcoholic solution separates at most only a few trifling flakes upon standing. On distilling or evaporating off the alcohol and ether, a gum-like mass, soluble in alcohol and water, is left behind, and this has the before-mentioned bitter taste.

On the other hand, a solution of 1 part of salicylic acid and 2 parts of borax in water has only a feeble acid reaction, and, instead of being bitter, is very sweet at first, then momentarily salty, and lastly again sweet. On evaporating this, the residue is only partly soluble in alcohol of spec. grav. 0.830, and this seems to be only borax. Addition of ether separates here also at most slight flakes, and upon evaporation the residue has the same bitter taste as in the case mentioned before, though after a while a faint trace of sweetness may be noticed.

There is no doubt about there being a peculiar combination formed between the acid and the borax, but its nature has not been cleared up. It does not appear to take place in absence of water or moisture. Borax contains ten molecules of water of crystallization. There is, therefore, enough water here to form a considerable quantity of the compound, and it is, no doubt, owing to this fact that the mass cakes. We find it, however, to cake much less than our correspondent did. It did not cake during the first hour or so, but next morning the mass was pretty firm, though it could be reduced to powder without difficulty.

In our opinion, the prescriber had no idea of this reaction, and would probably not have ordered the prescription had he known it. We think you ought to let him know. If you cannot do this, then you would be justified in drying the borax sufficiently (it is not necessary to dehydrate it completely) to avoid the caking.

No. 2,342.—**Exalgine** (I. J.).

This substance, which has long been known under another name, viz., *methylacetanilide*, has been experimented with, to some extent, in one of the hospitals of this city, and has been found to produce partial or entire insensibility to pain, such as that caused by various forms of neuralgia, etc., as had been reported. It has, however, not yet been available in sufficient quantity to make extensive experiments, though by the time this number of our journal appears there will be an ample supply on the market.

Regarding the chemistry of methylacetanilide (first described by Hepp and Hofmann in 1874, *Ber. d. Deutsch. Chem. Ges.*, Vol. 10, 328, 599) the following explanation will suffice:

When an atom of hydrogen, in the benzol-ring $C_6H_6$, is replaced by amidogen $NH_2$, the resulting product is *aniline:* $C_6H_5NH_2$, which, for this reason, is also called *amidobenzol*. If we now imagine *one* of the hydrogens of the group $NH_2$ to be replaced by a monatomic rest of a fatty acid—that is, a fatty acid less one molecule of hydroxyl (OH)—we obtain an *anilide*. Acetic acid is $C_2H_4O_2$, or $-C_2H_3O.OH$. When the group $C_2H_3O$ replaces one of the hydrogens in aniline, we obtain the *acetanilide* (known otherwise as antifebrin):

$$\underset{\text{aniline}}{C_6H_5NH_2} + \underset{\text{acetic acid}}{C_2H_3O.OH} = \underset{\text{acetanilide}}{C_6H_5NH(C_2H_3O)} + \underset{\text{water.}}{H_2O}$$

Similarly, if formic acid, $CH_2O_2$, or CHO.OH, were to enter into combination with aniline to form an anilide, we would obtain *formanilide:*

$$\underset{\text{aniline}}{C_6H_5NH_2} + \underset{\text{formic acid}}{CHO.OH} = \underset{\text{formanilide}}{C_6H_5NH(CHO)} + \underset{\text{water.}}{H_2O}$$

This substance, formanilide, by the way, has recently been found to possess most remarkable properties. Injected into small animals in doses of about ½ grain, it produced complete immobility, insensibility, and apparent death, from which the animal usually recovered after some time.

In the same manner various other anilides are formed. It may be added that the above explanation of the formation of anilides is not the one usually given. For certain reasons, which need not be given here, they are usually regarded as derived from acid amides, by the substitution

of $C_6H_5$ (phenyl) for one of the hydrogens of $NH_2$. But in the end the result would be the same.

Now, there is still *one* atom of hydrogen left in the series of anilides mentioned above. But this may also be replaced by a monatomic radical, such as $CH_3$ (methyl), $C_2H_5$ (ethyl), etc., and thus we obtain compound anilides; for instance:

$$C_6H_5N\begin{cases}CH_3\\C_2H_3O\end{cases} = \text{methyl-acetanilide (or "exalgine").}$$

$$C_6H_5N\begin{cases}C_2H_5\\C_2H_3O\end{cases} = \text{ethyl-acetanilde,}$$

$$C_6H_5N\begin{cases}CH_3\\CHO\end{cases} = \text{methyl-formanilide, etc., etc.}$$

Now, *exalgine* is the first mentioned among the above three compounds. It is prepared by acting upon sodium-acetanilide with iodide of methyl. It appears in needles or long tablet-like crystals, is sparingly soluble in water, readily in hot water, also in dilute alcohol, or in water containing a little alcohol.

It has been erroneously called "orthomethylacetanilide," as if there were also a *meta* and a *para* variety; but this is a mistake. The methyl group does not substitute one of the hydrogens of the benzol ring, but of the side ring, in which there is only *one* product possible, when the hydrogens are replaced by certain organic radicals.

No. 2,343.—**Root Beer** (J. C. L.).

There is no end to the recipes and formulas for so-called root beer. Our correspondent says that he has perhaps all material and appliances necessary for it at hand. If this is the case, we do not see what good we can do by offering a formula which may call for material different from that which he has. Nevertheless, at the risk of mentioning articles which he has not in stock, we will give him a formula furnished to us some time ago by one of our friends. We have not tried it ourselves, but are told that it furnishes a pleasant product:

| | |
|---|---|
| Parsley Root, fresh | 6 oz. |
| Wintergreen | 4 " |
| Sassafras | 4 " |
| Spicewood Bark | 4 " |
| Wild Cherry | 2 " |
| Prince's Pine | 2 " |
| Hemlock Bark | 2 " |
| Jamaica Ginger | 2 " |
| Capsicum | ½ " |
| Vanilla | ½ " |
| Sugar, gran | 4 " |
| Syrup ("golden drips") | 2 gall. |
| Water | q. s. |
| Yeast | 4 oz. |

Triturate the vanilla, finely cut, with the granulated sugar gradually added, to as fine a powder as possible. Reduce the other solid ingredients to a coarse powder by bruising or cutting, pack it in a percolator having a stopcock, and put the saccharated vanilla on top. Then cover the contents with boiling water, and cover the percolator. When the liquid is cold, draw it off. Again pour on boiling water, allow to cool, draw it off, and continue to do this until 4 gallons of liquid are obtained. To this add the syrup, put the mixture into a keg, add the yeast, and allow it to ferment. When it has ceased to ferment, draw it off clear and bottle it.

No. 2,344.—**Laws against Abortifacients** (G. V. D.).

This correspondent asks whether there is not a law on the statute books of this State prohibiting druggists from selling certain proprietary articles supposed to be used as abortifacients, such as: Capsules of Apiol (Joret et Homolle), Pennyroyal Pills, Dr. Cheesman's Female Pills, Hooper's Female Pills, Clark's Female Pills, etc., etc.

So far as we know, there is no such law, either respecting druggists or any other persons. We presume that if any damage, accident, or death were caused by such remedies, the person who has sold the latter could be readily prosecuted. The sale of such articles, even if called for—and they are by no means as efficacious as they are supposed to be—is in our judgment reprehensible, but in a far less degree than the bare-faced, impudent, and sometimes prurient advertisements of abortion quacks in the lay newspapers. The latter do much more harm than the former.

No. 2,345.—**Ink Eraser** ("Drugs").

This inquirer wants to know if we can recommend him some compound which will "erase ink."

In reply we would say that it all depends on what kind of ink is to be erased, and from what kind of surface.

Assuming, for present purposes, that it is an iron ink, we can recommend the following mode of procedure: Moisten the spot—on paper, linen, or other surface—with a little water, and pile upon it a pinch of a powdered mixture of equal parts of oxalic and citric acids. Allow this to remain for some time. The powder should be in sufficient quantity, so as not to completely dissolve, should be distinctly wet, and cover the spot as well as a little distance beyond it. After 15 to 30 minutes the spot may be carefully cleansed with water. In the case of paper, care must be taken not to tear or otherwise injure the paper.

No. 2,346.—**Creosote and Arsenious Acid** ("Dentos").

Arsenious acid is insoluble in beechwood-tar creosote. We know of no agent which, added to the creosote, would enable the latter to hold the acid in solution. But if the creosote were dissolved in alcohol or in acetic acid, this liquid would then be able to dissolve a quantity of arsenious acid proportionate to the added solvent. Of course, the better plan would be first to dissolve the acid to saturation (or in smaller amount, as may be required) in the alcohol or acetic acid, and then to mix this with creosote short of producing a precipitate. At the best, only a small amount of arsenious acid could thus be brought into solution.

No. 2,347.—**Manufacture of C. P. Salts** (J. A. H.).

This subscriber asks us to name him some practical work on the manufacture of C. P. salts, such as are used in photography and medicine, with articles on the construction of apparatus, etc.

So far as we know, there is no *one* work which will completely fill the bill. As medicinal chemicals are generally of a sufficient degree of purity to answer for purposes of photography, we would suggest that our correspondent consult the following works: 1. The United States and the National Dispensatories. 2. "Remington's Practice of Pharmacy." 3. Hager, "Commentar zur Pharmacopœia Germanica," Berlin, 1883–84 (so far as the chemicals are officinal in the Germ. Pharm.). 3. Flueckiger, "Pharmaceutische Chemie," Berlin, 1888. 4. Schmidt, Dr. E., "Ausführliches Lehrbuch d. Pharmaceut. Chemie," 2d ed. 5. Roscoe & Schorlemmer, "Treatise on Chemistry." 6. Stieren, Dr. E., "Chemische Fabrik" (with illustrations), 8vo, München, 1865, etc., etc.

No. 2,348.—**Aureoline** (D.).

Robare's Aureoline is not used in this country. It is a solution of hydrogen peroxide, of about 6 volumes, and is used for rendering hair blond.

## Corrected Tables of Specific Gravity and Strength of Water of Ammonia.

THE table of Carius, which has hitherto been considered the most reliable one, regarding the specific gravity and percentage strength of water of ammonia, has recently been revised by G. Lunge and T. Wiernick upon the basis of very careful experiments (*Zeitsch. f. angew. Chem.*, 1889, 181). As this table is frequently consulted, especially certain portions of it, we reproduce it here:

The *third column* gives the figure which is to be added (+) to the spec. grav. when taken *above* 15° C., or to be deducted (—) from it when taken *below* 150° C., in order to reduce it to the normal specific gravity at 15° C.

| Spec. Grav. at 15° C. | Per cent. of $NH_3$ | 1 Liter contains at 15° C Gm. of $NH_3$ | Correction of Spec. Grav. for every 1° C. + or —. | Spec. Grav. at 15° C. | Per cent of $NH_3$. | 1 Liter contains at 15° C. ... Gm. of $NH_3$. | Correction of Spec. Grav. for every 1° C. + or —. |
|---|---|---|---|---|---|---|---|
| 1.000 | 0.00 | 0.0 | 0.00018 | 0.940 | 15.63 | 146.9 | 0.00039 |
| 0.998 | 0.45 | 4.5 | 0.00018 | 0.938 | 16.22 | 152.1 | 0.00040 |
| 0.996 | 0.91 | 9.1 | 0.00019 | 0.936 | 16.82 | 157.4 | 0.00041 |
| 0.994 | 1.37 | 13.6 | 0.00019 | 0.934 | 17.42 | 162.7 | 0.00041 |
| 0.992 | 1.84 | 18.2 | 0.00020 | 0.932 | 18.03 | 168.1 | 0.00042 |
| 0.990 | 2.31 | 22.9 | 0.00020 | 0.930 | 18.64 | 173.4 | 0.00042 |
| 0.988 | 2.80 | 27.7 | 0.00021 | 0.928 | 19.25 | 178.6 | 0.00043 |
| 0.986 | 3.30 | 32.5 | 0.00021 | 0.926 | 19.87 | 184.2 | 0.00044 |
| 0.984 | 3.80 | 37.4 | 0.00022 | 0.924 | 20.49 | 189.3 | 0.00045 |
| 0.982 | 4.30 | 42.2 | 0.00022 | 0.922 | 21.12 | 194.7 | 0.00046 |
| 0.980 | 4.80 | 47.0 | 0.00023 | 0.920 | 21.75 | 200.1 | 0.00047 |
| 0.978 | 5.30 | 51.8 | 0.00023 | 0.918 | 22.39 | 205.6 | 0.00048 |
| 0.976 | 5.80 | 56.6 | 0.00024 | 0.916 | 23.03 | 210.9 | 0.00049 |
| 0.974 | 6.30 | 61.4 | 0.00024 | 0.914 | 23.68 | 216.3 | 0.00050 |
| 0.972 | 6.80 | 66.1 | 0.00025 | 0.912 | 24.33 | 221.9 | 0.00051 |
| 0.970 | 7.31 | 70.9 | 0.00025 | 0.910 | 24.99 | 227.4 | 0.00052 |
| 0.968 | 7.82 | 75.7 | 0.00026 | 0.908 | 25.65 | 232.9 | 0.00053 |
| 0.966 | 8.33 | 80.5 | 0.00026 | 0.906 | 26.31 | 238.3 | 0.00054 |
| 0.964 | 8.84 | 85.2 | 0.00027 | 0.904 | 26.98 | 243.9 | 0.00055 |
| 0.962 | 9.35 | 89.9 | 0.00028 | 0.902 | 27.65 | 249.4 | 0.00056 |
| 0.960 | 9.91 | 95.1 | 0.00029 | 0.900 | 28.33 | 255.0 | 0.00057 |
| 0.958 | 10.47 | 100.3 | 0.00030 | 0.898 | 29.01 | 260.5 | 0.00058 |
| 0.956 | 11.03 | 105.4 | 0.00031 | 0.896 | 29.69 | 266.0 | 0.00059 |
| 0.954 | 11.60 | 110.7 | 0.00032 | 0.894 | 30.37 | 271.5 | 0.00060 |
| 0.952 | 12.17 | 115.9 | 0.00033 | 0.892 | 31.05 | 277.0 | 0.00060 |
| 0.950 | 12.74 | 121.0 | 0.00034 | 0.890 | 31.75 | 282.6 | 0.00061 |
| 0.948 | 13.31 | 126.2 | 0.00035 | 0.888 | 32.50 | 288.6 | 0.00062 |
| 0.946 | 13.88 | 131.3 | 0.00036 | 0.886 | 33.25 | 294.6 | 0.00063 |
| 0.944 | 14.46 | 136.5 | 0.00037 | 0.884 | 34.10 | 301.4 | 0.00064 |
| 0.942 | 15.04 | 141.7 | 0.00038 | 0.882 | 34.95 | 308.3 | 0.00065 |

**Dr. Oskar Schlickum**, well known as an authority in the various branches of knowledge relating to pharmacy, died on April 4th, the eve of his fifty-first birthday, at Winningen (Gov. Dist. Coblentz), Germany.

**"See!** The Corncuring Hero Comes!" is the heading to a show-card displayed in the window of an English "chemist."

### Impurities in Saccharin.

SINCE the discovery and announcement of the sweet principle derived from benzol—viz., *saccharin*, or, to call it by its chemical name, *orthosulphaminebenzoic acid*—we have followed its development from step to step up and beyond the time when the article was turned out at a manufacturing sale, under the patent granted to the discoverer, or at least to the one who claimed to be the discoverer, namely, Fahlberg, one of the former students in Prof. Ira Remsen's laboratory at Baltimore. Up to the present we have labored under the impression that the saccharin put on the market was, practically speaking, a pure product. We have, however, been undeceived in this respect by the testimony given in the Inaugural Essay of Dr. A. R. L. Dohme, of Baltimore.*

Dr. Dohme, having occasion to require considerable quantities of the true orthosulphobenzoic acid, decided to obtain this from the commercial saccharin (anhydro-orthosulphaminebenzoic acid, or, as Dr. Dohme prefers to call it, "benzoic sulphinide"). On carefully examining this he found it far from pure, containing only between 30 and 40 per cent of the pure substance. An approximate analysis of the commercial article showed it to contain:

| | |
|---|---|
| Benzoic sulphinide (*the true sweet principle*) | 30–40 % |
| Parasulphaminebenzoic acid | 50–60 % |
| Orthotoluenesulphamide, orthosulphaminebenzoic acid, acid potassium, and acid ammonium orthosulphobenzoates | 10 % |

The benzoic sulphinide, which is the real valuable constituent, is separated from the other substances by dissolving the crude saccharin in boiling water, in which it is entirely soluble. Upon cooling, the parasulphaminebenzoic acid crystallizes out in small, brilliant pearly scales melting at 280° C. The separation of the remaining substances from each other is quite difficult, as they are about equally soluble in water and alcohol. If it is desired to obtain the benzoic sulphinide, as such, the best way is either to recrystallize and mechanically separate the crystals of the latter substance, which are quite different from the accompanying crystals, or to extract with ether, in which only the benzoic sulphinide is soluble. Thus obtained, the latter crystallizes in light yellow to colorless plates or fern-shaped crystals melting at 223° to 225° C.

From this statement it follows that the purity of "saccharin" may easily be tested by treating it with ether, which dissolves the benzoic sulphinide—the real bearer of the sweet taste which the product possesses. Anything insoluble in ether is to be regarded as foreign material, diluting the real valuable principle.

* "Orthosulphobenzoic Acid and Some of Its Derivatives." Dissertation presented to the Board of University Studies of the Johns Hopkins University for the degree of Doctor of Philosophy, by A. R. L. Dohme, of Baltimore. 1889. Baltimore, pp. 38.

## BIBLIOGRAPHY.

MERCK'S INDEX of Fine Chemicals and Drugs for the Materia Medica and the Arts. Comprising a Summary of whatever Chemical Products are to-day Adjudged as being Useful in either Medicine or Technology. With average Values and Synonyms. A Guide for the Physician, Apothecary, Chemist, and Dealer. By E. Merck. 8vo, New York, 1889. Price $1.00.

THE appearance of "Merck's Index" marks a veritable era in chemical "price-lists." We have, for some time past, been aware that a work of the kind, such as lies before us, was in course of preparation, and we were particularly aware that the greatest care would be bestowed upon the *nomenclature*, so that a completely new departure could be made in labelling chemical products for trade in English-speaking countries. That extraordinary pains have been taken to make this important feature as perfect as possible, an examination of the contents of the book will easily reveal. The English nomenclature and orthography followed for the designations of chemical compounds are, in the main, those adopted by the Chemical Society of England and by most of the modern text-books and treatises of chemistry, both in England and the U. S.

A most valuable feature of the work are the numerous synonyms by which the various products are known, and the ease with which any name can be found, since even synonyms are entered as leading words in their proper alphabetical places.

"Merck's Index," containing the names and synonyms, often with explanatory notes, of some five thousand chemical and allied products is undoubtedly a most useful book of reference for the pharmacist, the physician, the chemist and the teacher of materia medica. May the example thus set be soon imitated by our prominent wholesale drug houses, which would soon reap their reward from an undertaking of this kind.

A POSTAL DICTIONARY. Being an Alphabetical Handbook of Postal Rates, Laws, and Regulations for All who Use the Mails. Compiled from Official Sources by EDWARD ST. JOHN. New York: The *Evening Post*, 208 Broadway, 1889. Pp. 94. 15c.

THIS is an extremely useful manual for everybody, its contents covering nearly every subject relating to postal rates and regulations, and having, besides an alphabetical arrangement, an index which facilitates reference.

HANDBOOK OF MATERIA MEDICA, PHARMACY, AND THERAPEUTICS, Compiled for Students Preparing for Examination. By CUTHBERT BOWEN, M.D., B.A., Editor of "Notes on Practice." Philadelphia and London: F. A. Davis, Publisher, 1888. Pp. 366, sm. 8vo.

As its title indicates, this is intended as a reminder of leading facts; but it also contains numerous formulas such as delight the heart of the average medical student, and may save him much laborious copying from blackboards.

THE PSYCHIC LIFE OF MICRO-ORGANISMS: A Study in Experimental Psychology. By ALFRED BINET. Translated from the French by THOMAS MCCORMACK. With a Preface by the Author written especially tor the American Edition. Chicago: The Open Court Publishing Co., 1889. Pp. 120, 8vo. 75c.

AN argument to prove that the lowest forms of animal life manifest psychological phenomena is about as interesting and practical as the paper must have been which was read before Mr. Pickwick's society on tittlebats.

INTERNATIONAL POCKET MEDICAL FORMULARY, with an Appendix. By C. SUMNER WITHERSTINE, M.S., M.D. Philadelphia: F. A. Davis, 1888. Pp. 269, 12mo. Leather with flap. Leather-indexed. $2.00.

THIS contains, besides a most elaborate appendix, 1,658 prescriptions classified under alphabetically arranged names of all the diseases from *Abortion* to *Yellow Fever*. It can be carried in a moderately large pocket and is a *sine qua non* for the "busy practitioner."

A GUIDE TO THERAPEUTICS AND MATERIA MEDICA. By ROBERT FARQUHARSON, M.P., M.D., etc. Fourth American from the Fourth English Edition. Enlarged so as to Include all Preparations Officinal in the U. S. Pharmacopœia. By FRANK WOODBURY, A.M., M.D. Philadelphia: Lea Bros. & Co., 1889. Pp. 598, 8vo.

THIS is already well known as one of the most admirable of the handbooks intended for the use of medical students. The arrangement of the text and choice of type facilitate easy reference, and, while its matter is well condensed, it does not too closely approach to the character of a mere cram-book.

NEW COMMERCIAL PLANTS AND DRUGS. No. 11. By THOMAS CHRISTY, F.L.S., etc. London: Christy & Co., 25 Lime street, E. C., 1889. Pp. 88, 8vo. 2/6.

THIS issue of this ever-welcome serial contains articles relating to Veronica nigritiana, Boerhaavia diffusa, Piche, Jambul, Ballota, Lycopodium tincture, Manaca, Salix nigra, Haya poison, Eucalyptus Honey, Sozoiodol, Mudar Bark, etc.

PRICED AND ILLUSTRATED CATALOGUE of Chemical Apparatus, Assayers' Materials, and General Laboratory Supplies, made, imported, and sold, wholesale and retail, by James W. Queen & Co., of Philadelphia. Pp. 364, 8vo.

THIS is one of the most complete and beautiful publications of its kind of which we are aware. It contains illustrations and brief descriptions of many recent forms of apparatus and should be in the library of every laboratory.

COLLEGE BOTANY, including Organography, Vegetable Histology, Vegetable Physiology, and Vegetable Toxotomy, with a Brief Account of the Succession of Plants in Geologic Time, and a Glossary of Botanical Terms; being a Revised and Enlarged Edition of the "Elements of Botany," with nearly 600 Illustrations, largely from Drawings by the Author. By EDSON S. BASTIN, A.M., F.R.M.S., Professor of Botany, Materia Medica, and Microscopy in the Chicago College of Pharmacy. Chicago: G. P. Engelhard & Co., 1889. Pp. 451, 8vo.

THIS work being especially intended for pharmaceutical and medical students, it will be found that the practical exercises following each chapter are of particular value. The whole work shows great care in its preparation, the illustrations being numerous, the language simple, the type and paper excellent, the binding substantial and handsome.

We have but one suggestion to offer, and that is the provision, in future editions, of a scheme of study arranged according to seasons. If, as the author states, the study of botany is the study of plants and not the study of books, the scheme of study should be so arranged that, commencing with the early days of spring, a student may be able to study plants as they exist in nature, and not have autumn fruits, vernal germination, and summer inflorescence all jumbled together to illustrate some arbitrary system of classification.